The PHOTOFACT Servicer

SET 455 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ SEPT., 1959

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This Servicer provides you with essential data on other models or special equipment not covered in standard PHOTOFACT folders. The schematics and supplementary data included here will be of valuable help to you in servicing this equipment.

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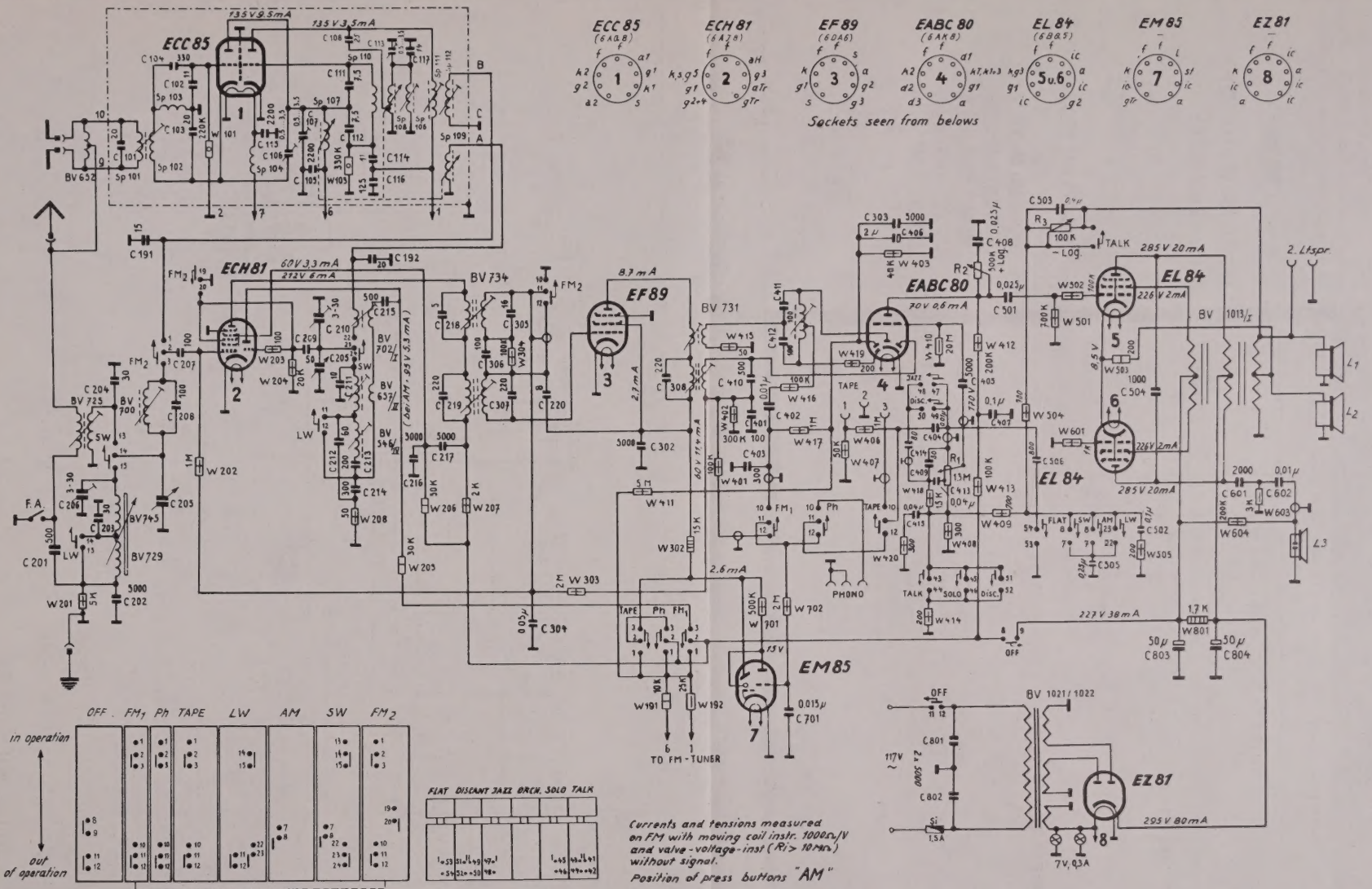
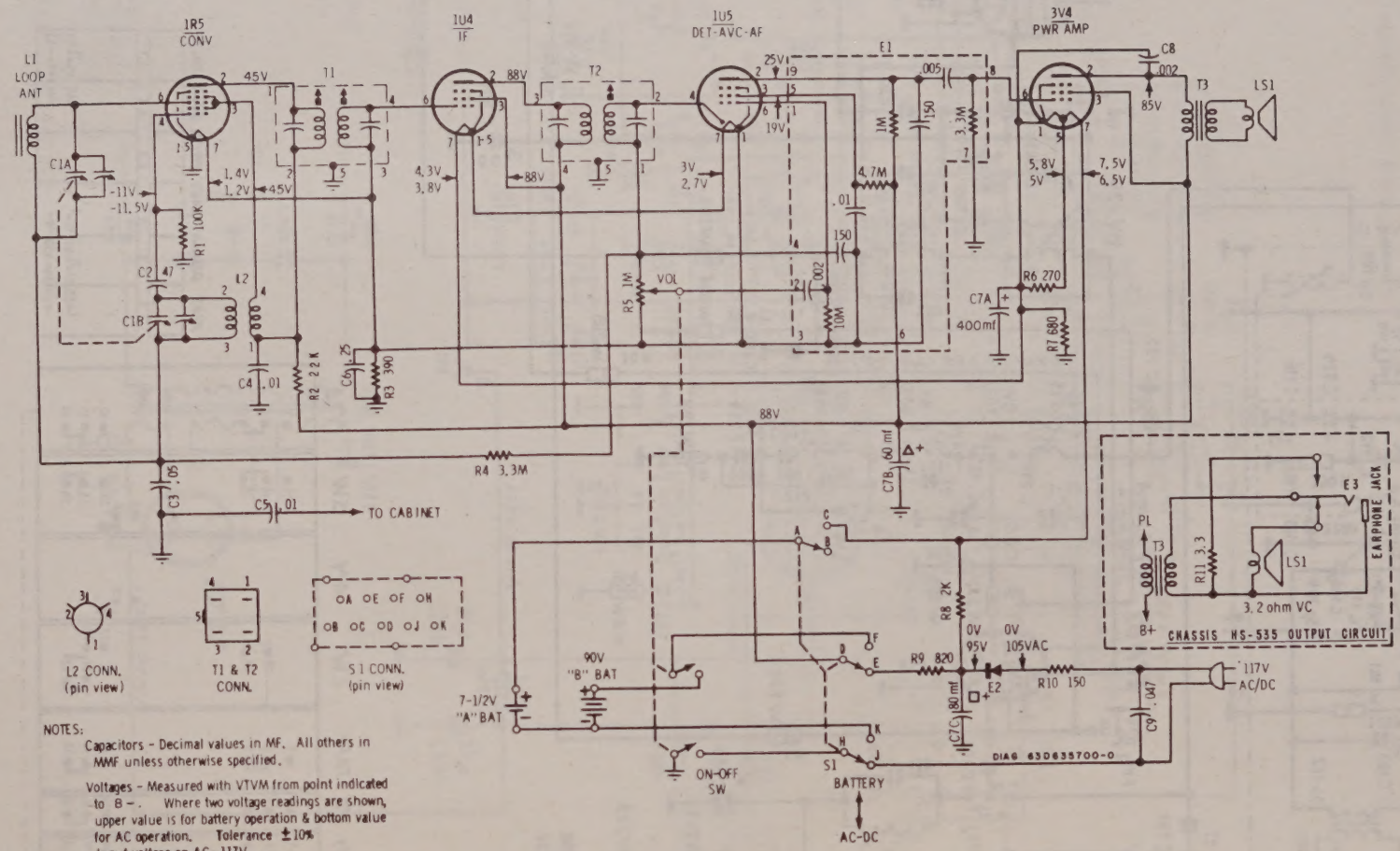


KUBA MODEL 821W

Schematic Diagram Courtesy of Kuba Tonmobel u. Apparatebau Wolfenbuttel



NOTES:

Capacitors - Decimal values in MF. All others in MMF unless otherwise specified.

Voltages - Measured with VTVM from point indicated to B-. Where two voltage readings are shown, upper value is for battery operation & bottom value for AC operation. Tolerance ±10% Input voltage on AC - 117V.

IF - 455 Kc Tuning Range - 535 to 1620 Kc

MOTOROLA MODEL 56B1 (CH. HS-533)

MODELS 56L1, 2, 3, 4 (CH. HS-534)

MODELS 56M1, 2, 3 (CH. HS-535)

Schematic Diagram Courtesy of Motorola Inc.

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

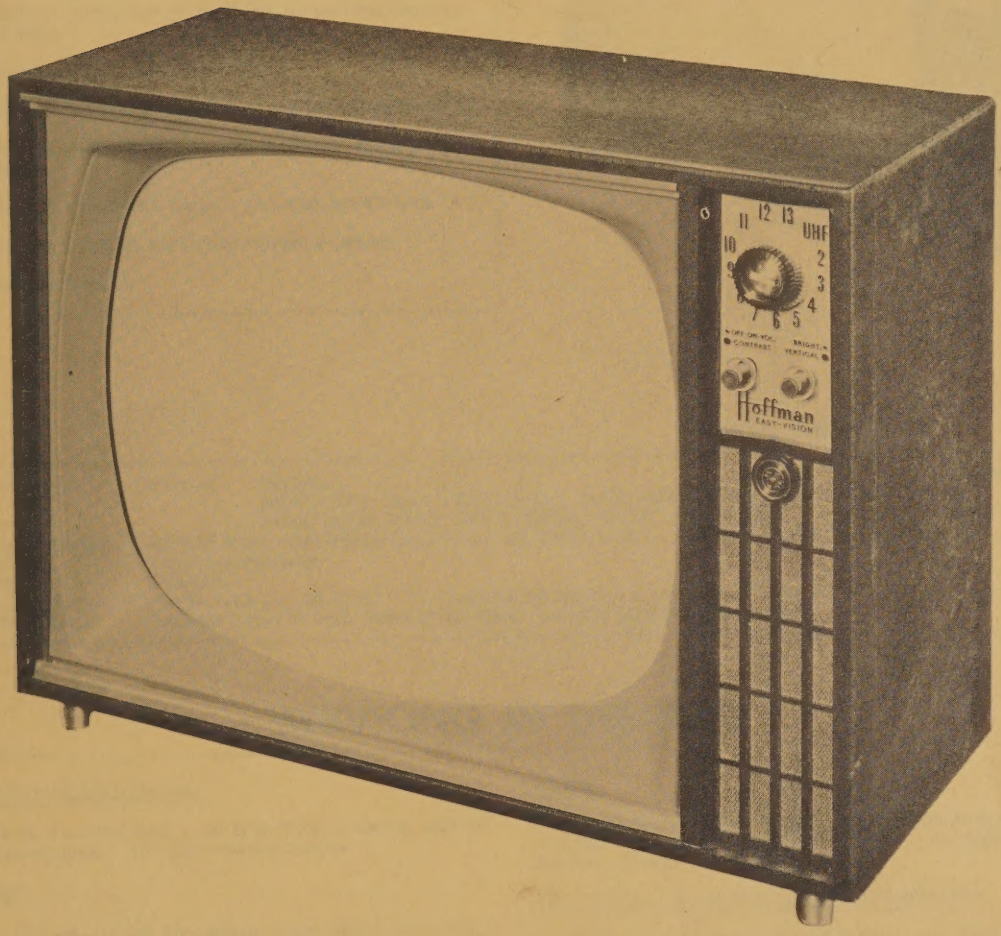
HOFFMAN MODELS 1327 Series, 1331 Series, 3561 Series, 3571 Series (Ch. 344, A)

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

HOFFMAN MODELS 1327 Series, 1331 Series, 3561 Series, 3571 Series (Ch. 344, A)



MODEL K1331 (Ch. 344)

HOFFMAN MODELS 1327 Series, 1331 Series, 3561 Series, 3571 Series (Ch. 344, A)

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

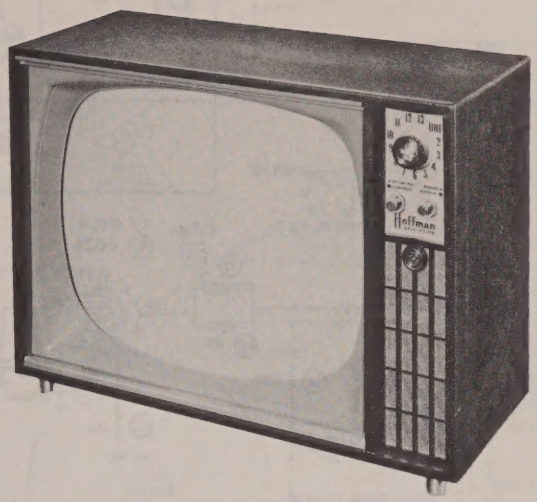
PHOTOFACT* Folder

HOFFMAN MODELS 1327 Series, 1331 Series, 3561 Series, 3571 Series (Ch. 344, A)

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL MODEL K1331

1. Remove 13 screws holding rear cover. Remove the rear cover.
2. Remove 6 push-on type knobs from the front.
3. Remove 1 screw that is visible after removing Fine Tuning knob.
4. Remove front control panel cover.
5. Remove 4 screws holding front control panel and speaker.
6. Remove picture tube grounding lead from front control panel.
7. Remove picture tube socket, yoke plug and HV lead.
8. Remove 2 chassis bolts from bottom of cabinet.
9. Remove chassis.



MODEL K1331 (Ch. 344)

TRADE NAME	Hoffman	MODELS	CHASSIS
		B1327, B1331, K1327, K1331, M1327, M1331, P1327, SP1331, W1327, W1331	344
		B3561, B3571, M3561, M3571, SP3561, SP3571, W3561, W3571	344A
MANUFACTURER	Hoffman Electronics Corporation, Consumer Products Div., 6200 S. Avalon Blvd., Los Angeles 3, Calif.		
TYPE SET	Television Receiver		
TUBES	Nineteen		
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING 190 Watts, 1.8 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

Remove 4 screws holding the trim strip at the top edge of the safety glass. Tilt glass out and remove.

FUSE

One fuse is used for low voltage power supply protection. (For location, see "Tube Placement Chart".)

TUNER OSCILLATOR ADJUSTMENTS

To touch-up the VHF Oscillator, remove Channel Selector and Fine Tuning knobs.

AGC

The AGC may be varied by means of an AGC control. (For location, see "Tube Placement Chart".)

FOCUS

The focus may be varied by connecting the lead from pin 4 of the picture tube to various voltage point. (For location, see photo "Cabinet-Rear View".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

The Horizontal Frequency slug is used for the Horizontal Hold. (For location, see "Tube Placement Chart".)

HORIZONTAL DRIVE

The horizontal drive may be varied by a Horizontal Drive control. (For location, see "Tube Placement Chart".)

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

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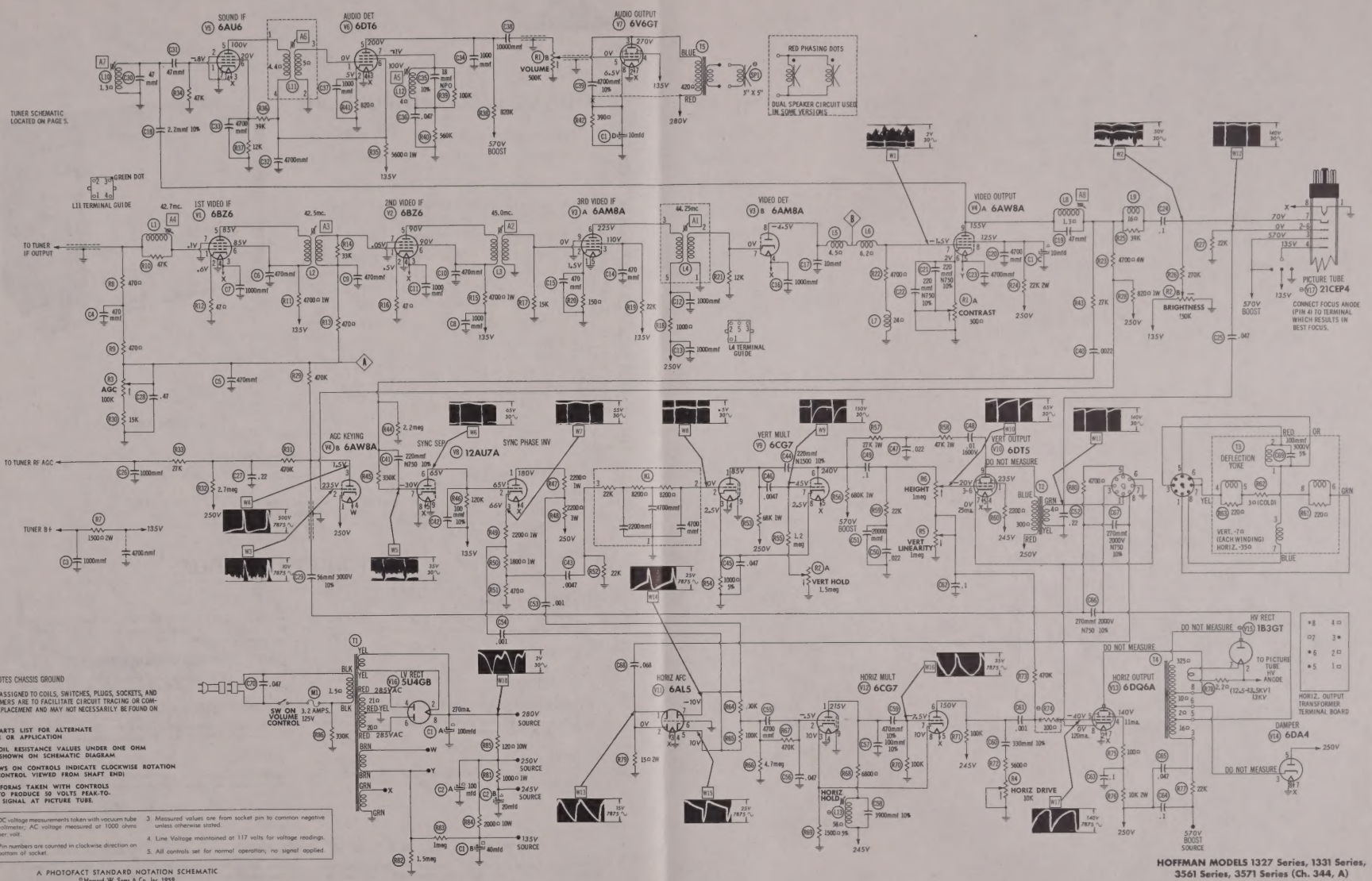
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

JA431

SET 455 FOLDER 1



⏚ DENOTES CHASSIS GROUND

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END).

WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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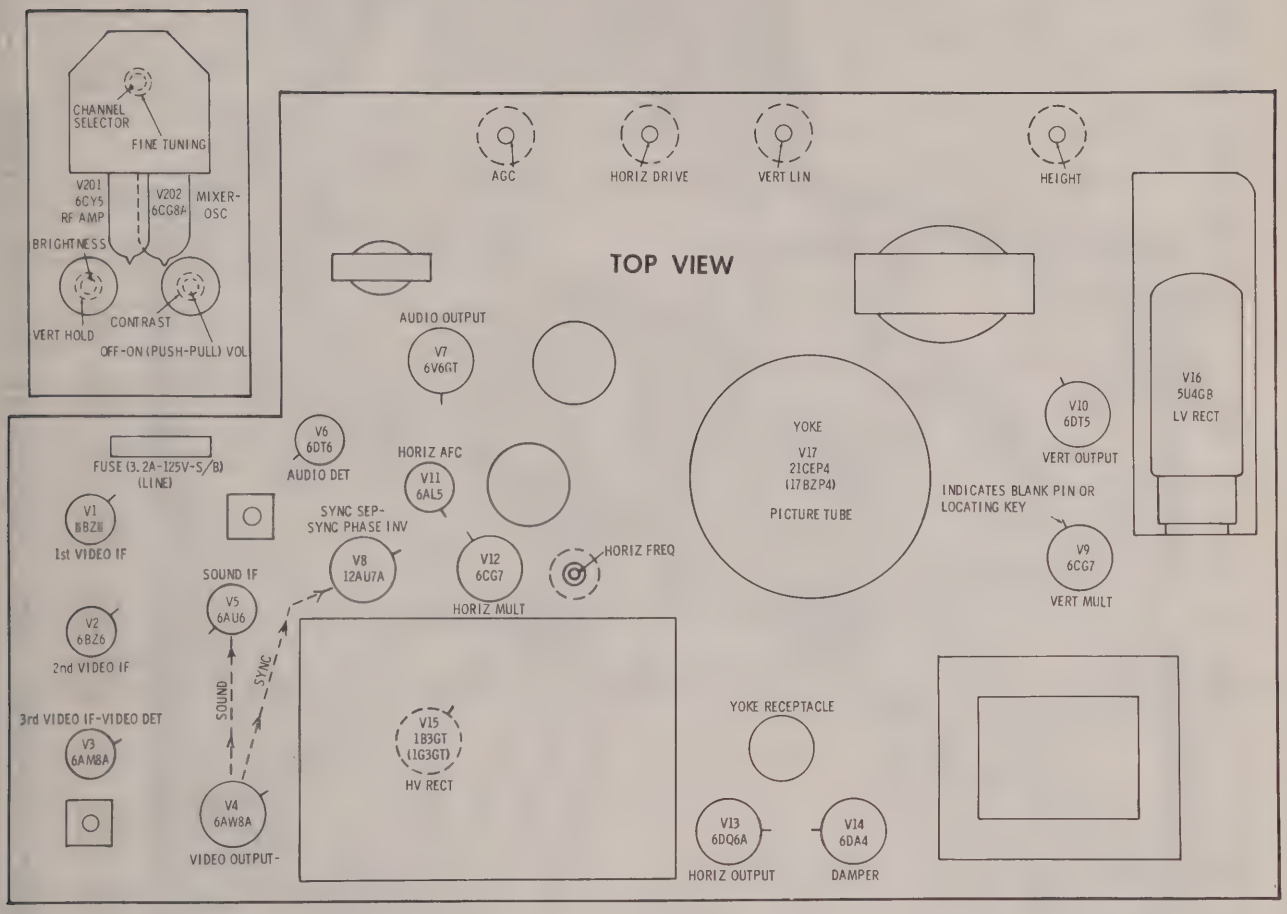
HOFFMAN MODELS 1327 Series, 1331 Series, 3561 Series, 3571 Series (Ch. 344, A)

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

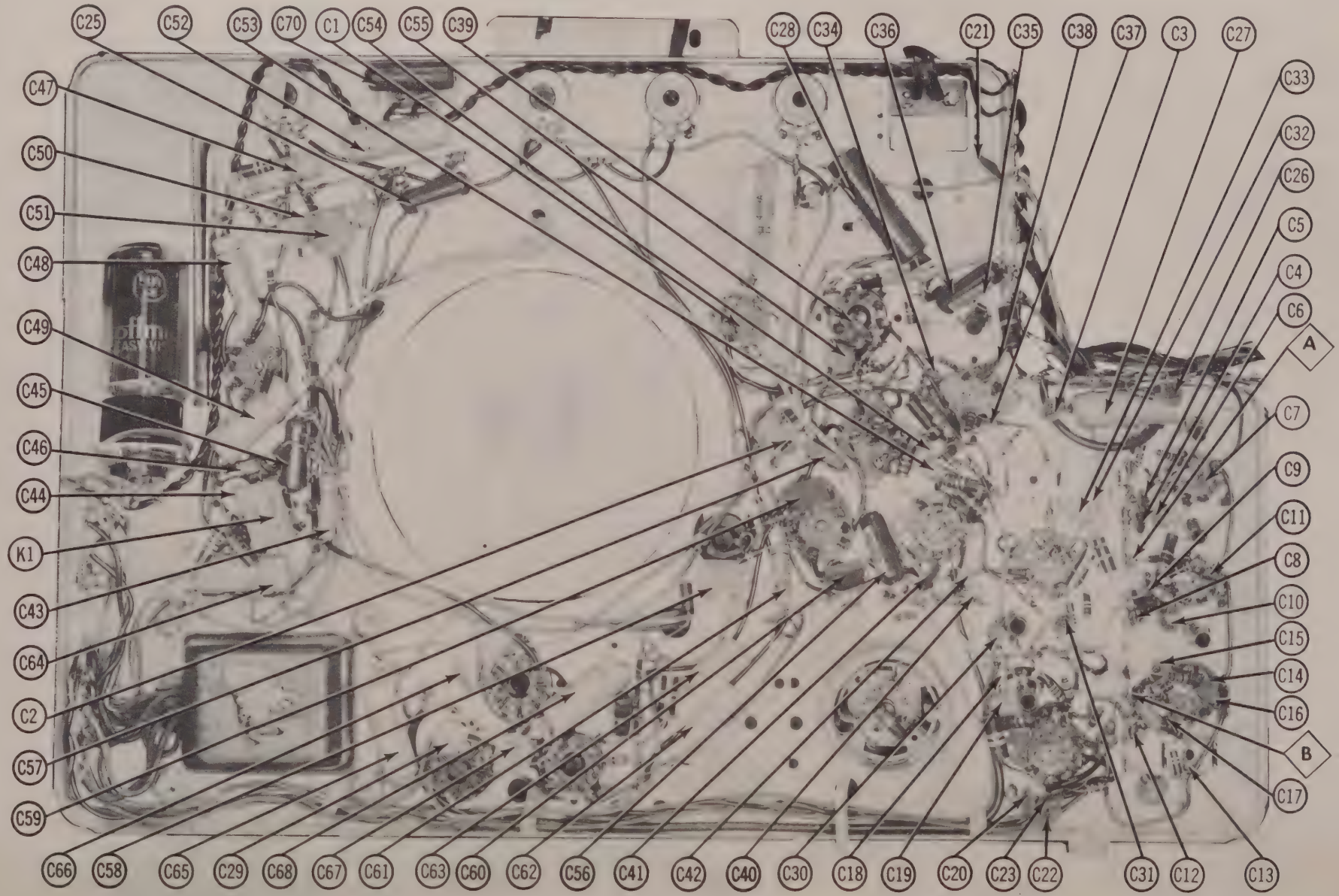
The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound Fuse (B+), V16

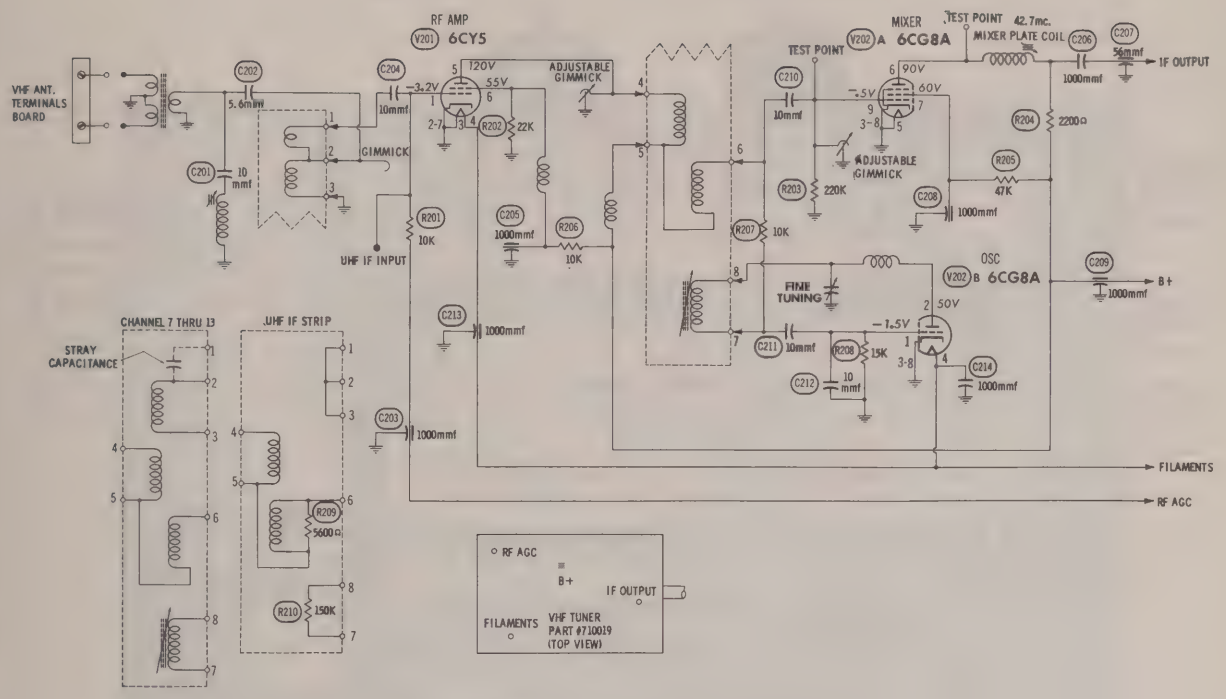
SWEEP FAILURE
No raster, has sound V11, V12, V13, V14, V15, V17, V16
No vertical deflection V9, V10
Poor vert. linearity or foldover V9, V10
Poor horiz. linearity or foldover V12, V13, V14
Narrow picture V16, V12, V13, V14
Vert. off freq. V9
Horiz. off freq. V11, V12

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V17
Has pic, no sound V5, V6, V7
Overloaded picture V4

SYNC FAILURE
No vert. sync V4, V8, V9
No horiz. sync V4, V8, V11, V12
No vert. or horiz. sync V4, V8



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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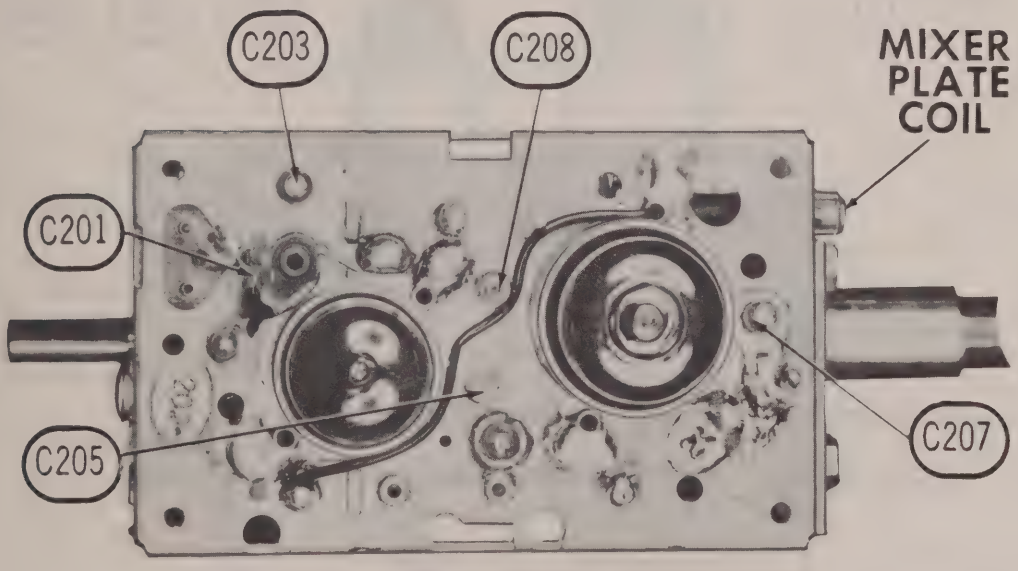
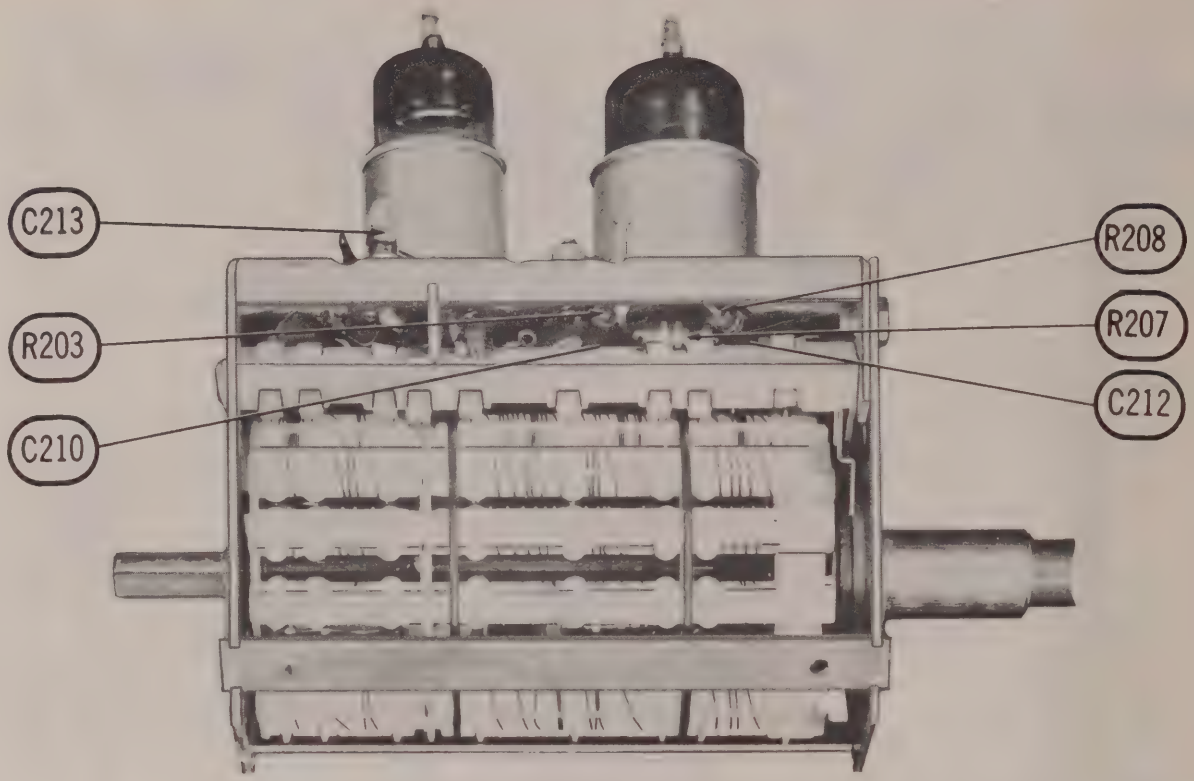
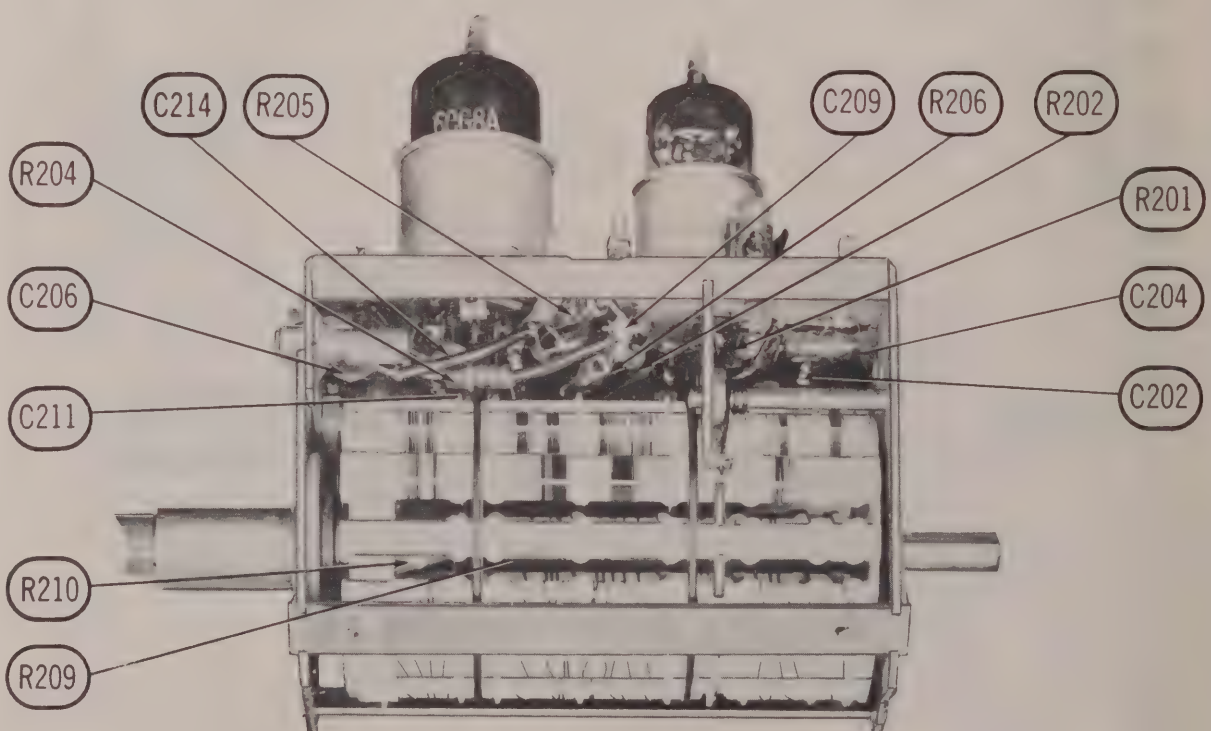
VHF TUNER 710019



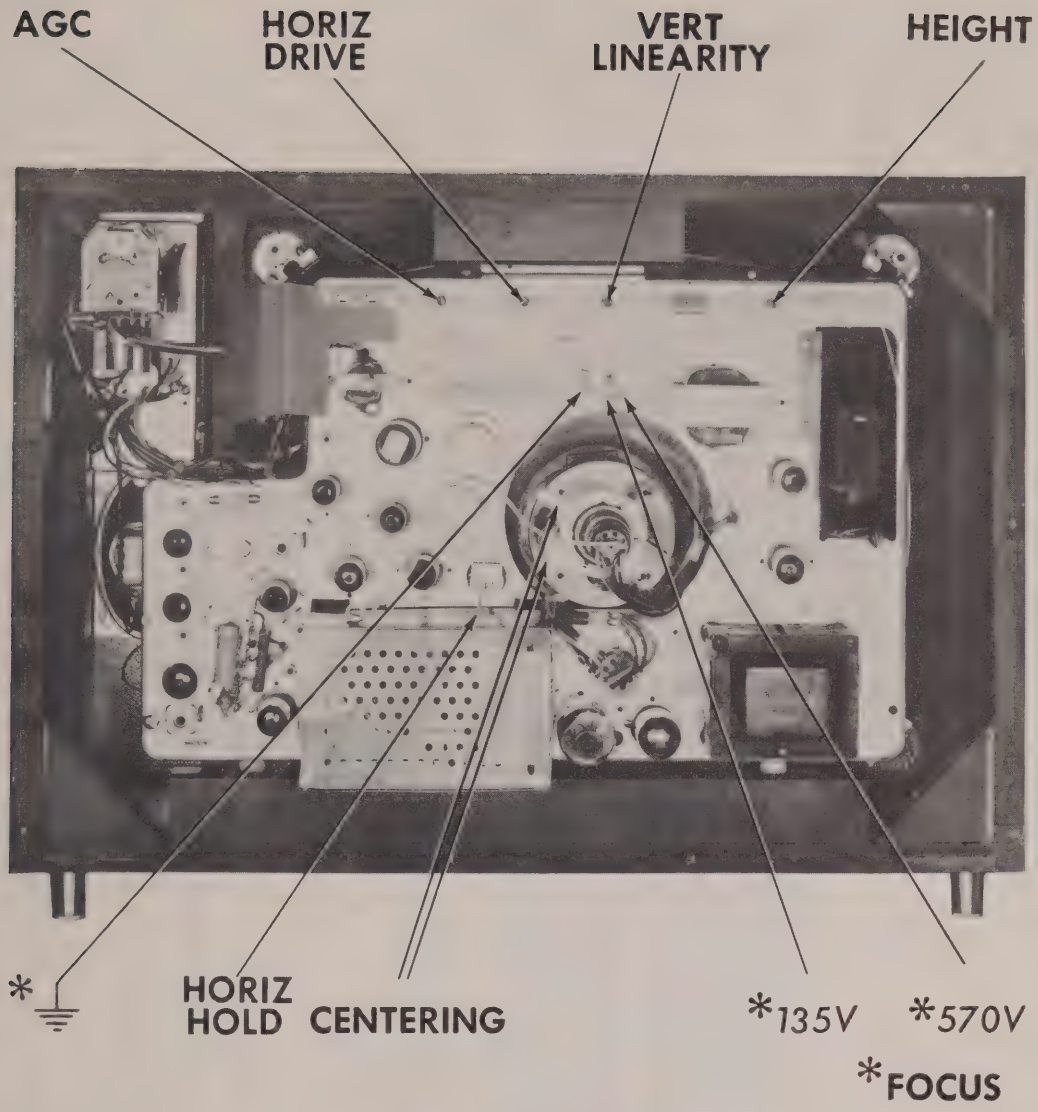
TUNER 710019 - TOP VIEW



TUNER 710019 - LEFT SIDE



TUNER 710019 - RIGHT SIDE



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Set the Brightness and Contrast controls for a normal picture.

Turn the Horizontal Hold clockwise until the picture loses sync. It may be necessary to switch off channel and back again for picture to lose sync.

Turn the Horizontal Hold slowly counterclockwise until the picture just falls into sync.

Turn to an unused channel. If vertical lines appear near the center of the screen, slowly adjust the Horizontal Drive (R4) until white lines disappear.

If the Horizontal Drive was adjusted, tune in a TV station and repeat above procedure. Check horizontal sync by switching off channel and back again.

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	1st Video IF Amp	6BZ6	
V2	2nd Video IF Amp.	6BZ6	
V3	3rd Video IF Amp. - Video Det	6AM8A	
V4	Video Output-AGC Keying	6AW8A	
V5	Sound IF Amp.	6AU6	
V6	Audio Det	6DT6	
V7	Audio Output	6V6GT	
V8	Sync Sep -Sync Phase Inv	12AU7A	

ITEM No	USE	TYPE	NOTES
V9	Vert Mult	6CG7	
V10	Vert. Output	6DT5	
V11	Horiz. AFC	6AL5	
V12	Horiz Mult	6CG7	
V13	Horiz. Output	6LQ6A	
V14	Damper	6DA4	
V15	HV Rect.	1B3GT	1G3GT *
V16	LV Rect.	5U4GB	

* Alternate.

PICTURE TUBE

ITEM No	REPLACEMENT DATA: HOFFMAN PART No	GENERAL ELECTRIC PART No	RCA PART No.	SYLVANIA PART No.	NOTES
V17	21CEP4	21CEP4 ①	21CEP4/ 21CEP4A ②	21BZP4/ 17BZP4/ 17CAP4 ②	① Aluminized ② "Silver Screen 85"
	17BZP4	17CKP4 ①	17BZP4 ①		

ELECTROLYTIC CAPACITORS

ITEM No	RATING: CAP	VOLT	REPLACEMENT DATA: HOFFMAN PART No.	AEROVOX PART No	CORNELL-DUBILIER PART No	MALLORY PART No	PYRAMID PART No	SPRAGUE PART No	NOTES
C1A	±100	350	857104	AFH4-05-60	D0044	FP425.6	TMQ-194	TVL8-4635.10 *	
B	±40	350							
C	±10	350							
D	10	350							
C4A	±100	350	856704	AFH2-100-50	C0230	FP256	TMT-29	TVL-2813	
B	±20	350							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	VOLT	TOL	HOFFMAN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C3	1000				BPD-001	DD-102	BYA10D1	B-210	5HK-D1	
C4	470				BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C5	470				BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C6	470				BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C7	1000				BPD-001	DD-102	BYA10D1	B-210	5HK-D1	
C8	1000				BPD-001	DD-102	BYA10D1	B-210	5HK-D1	
C9	470				BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C10	470				BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C11	1000				BPD-001	DD-102	BYA10D1	B-210	5HK-D1	
C12	1000				BPD-001	DD-102	BYA10D1	B-210	5HK-D1	
C13	1000				BPD-001	DD-102	BYA10D1	B-210	5HK-D1	
C14	470				BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C15	470				BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C16	1000				BPD-001	DD-102	BYA10D1	B-210	5HK-D1	
C17	10				6E10		L10QJ	UC-541	5GA-Q1	
C18	2.2		10%		NPO-SI 2.2	TC2-2R2	C10V22C	CNO-522	5TCCB-V22S 10% *	
C19	47				BPD-000047	DD-470	L10Q47	CNO-447	5GA-Q47	
C20	4700				BPD-0047	DD-472	BYA10D47M	B-347	5HK-D47	
C21	220		N750 10%		N750-D1 220	DTN-221	C10T22U	CNT-322	5TCU-T22S 10% *	
C22	220		N750 10%		N750-D1 220	DTN-221	C10T22U	CNT-322	5TCU-T22S 10% *	
C23	4700				BPD-0047	DD-472	BYA10D47M	B-347	5HK-D47	
C24	.1	400			P288N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C25	.047	300			P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C26	1000				BPD-001	DD-102	BYA10D1	B-210	5HK-D1	
C27	.22	200			P288N-22		CUB2P22	GEM-3022	2TM-P22	
C28	.47	200			P288N-47		CUB2P47	GEM-3047	2TM-P47	
C29	56	3000	10%					3DY-456	30GA-Q56S 10% *	
C30	47				BPD-000047	DD-470	L10Q47	CNO-447	5GA-Q47	
C31	47				BPD-000047	DD-470	L10Q47	CNO-447	5GA-Q47	
C33	4700				BPD-0047	DD-472	BYA10D47M	B-347	5HK-D47	
C33	4700				BPD-0047	DD-472	BYA10D47M	B-347	5HK-D47	
C34	1000		10%		DI-1000			JL-210	5GA-D1S 10% *	
C35	18		NPO 10%		NPO-DI 18	TC2-18	C10Q18C	CNO-418	5TCC-Q18S 10% *	
C36	.047	300			P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C37	1000				BPD-001	DD-102	BYA10D1	B-210	5HK-D1	
C38	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C39	4700		10%		DI-4700			JL-347	6TM-D47	
C40	.0022	400			P488N-0022	DD-222	CUB6D22	GEM-6222	6TM-D22	
C41	220		N750 10%		N750-D2220	DTN-220	C10T22U	CNT-322	5TCU-T22S 10% *	
C42	220		10%		DI-100	DD-101	L10T1	CNO-310	5GA-T1S 10% *	
C43	.0047	300			P288N-0047	DD-472	CUB6D47	GEM-6347	6TM-D47	
C44	220		N1800 10%							
C45	.047	200			P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C46	.0047	600			P688N-0047	DD-472	CUB6D47	GEM-6347	6TM-D47	
C47	.022	600			P688N-022	DD-203	CUB6S22	GEM-6122	6TM-S22	
C48	.01	1600			P168K(M-01	DDH8-103	CUBH6S1	GEM-6611	MB-S1	
C49	.1	600			P688N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C50	.022	600			P688N-022	DD-203	CUB6S22	GEM-6122	6TM-S22	
C51	20000				BPD-03	DD-303	BYB6S2	B-320	5HK-S3	
C52	.22	200			P288N-22		CUB2P22	GEM-3022	2TM-P22	
C53	.001	400			P488N-001	DD-102	CUB6D1	GEM-621	6TM-D1	
C54	.001	400			P488N-001	DD-102	CUB6D1	GEM-621	6TM-D1	
C55	.0047				BPD-0047	DD-472	BYA10D47M	B-347	5HK-D47	
C56	.047	200			P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C57	100		10%		1469-0001	DD-101	22R5T1	MCB235	MB-31	
C58	3900		10%		1464-0039		1R5D39	JL-339	MB-339	
C59	470		10%		1469-00047	MD-471	22R5T47	JL-347	MB-347	
C60	330		10%		1469-00033	MD-331	22R5T33	JL-333	MB-333	
C61	.001	400			P488N-001	DD-102	CUB6D1	GEM-621	6TM-D1	
C62	.1	200			P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C63	.1	400			P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C64	.1	600			P688N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C65	.047	600			P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C66	270	2000	N750 10%							
C67	270	2000	N750 10%							
C68	.068	600			P688N-068		CUB6S68	GEM-6168	6TM-S68	
C69	100	3000	5%						30GA-T1S 5% *	
C70	.047	600			P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: HOFFMAN PART No	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	200Ω	½	803035					Contrast
B	500K	½						Volume
C	Switch							Push-Pull Off-On
R2A	1.5meg	½	803036	F1-84				Vert. Hold
B	150K	½		R2-33				Brightness
R3A	100K	½	800038	AB-40	B47-100K-S	QII-128	PTA15L	AGC
B	Shaft			AK-19	Not Req.	TQ	Not Req.	
R4A	10K	½	800060	AB-14	B47-10K-S	BII-116	BU-20	Horiz. Drive
B	Shaft			AK-19	Not Req.	TM2	Not Req	
R5A	1meg	½	800039	AB-89	B47-1meg-S	QII-137	PTA1254L	Vert. Lin.
B	Shaft			AK-19	Not Req.	TQ	Not Req.	
R6A	1meg	½	800039	AB-89	B47-1meg-S	QII-137	PTA1254L	Height
B	Shaft			AK-19	Not Req	TQ	Not Req	

■ "STA-LOC" Equivalent: FA32L, OP1562, RUP55A.
▲ "STA-LOC" Equivalent: FA35L, RU154L, OP1562, IK2000.
▪ "Concentrikit" Equivalent: K-2 Kit with Base Elements & Shafts BII-138, P1-118 (Panel) BII-328, RI-200 (Rear)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING: OHMS	WATT	HOFFMAN PART No.	NOTES
R7	1500Ω	2		
R8	470Ω			
R9	470Ω			
R10	47K			
R11	4700Ω	1		
R12	47Ω			
R13	470Ω			
R14	33K			
R15	4700Ω	1		
R16	47Ω			
R17	15K			
R18	1000Ω			
R19	22K			
R20	150Ω			
R21	12K			
R22	4700Ω			
R23	4700Ω	4		
R24	22K	2		
R25	39K			
R26	270K			
R27	22K			
R28	820Ω	1		
R29	470K			
R30	15K			
R31	470K			
R32	2.7meg			
R33	27K			
R34	47K			
R35	5600Ω	1		
R36	39K			
R37	12K			
R38	820K			
R39	100K			
R40	560K			
R41	820Ω			
R42	390Ω			
R43	27K			
R44	2.2meg			
R45	330K			
R46	120K			

ITEM No.	RATING: OHMS	WATT	HOFFMAN PART No.	NOTES
R47	2200Ω	1		
R48	2200Ω	1		
R49	2200Ω	1		
R50	18000	1		
R51	470Ω			
R52	22K			
R53	68K	1		
R54	1000Ω 5%			
R55	1.2meg			
R56	680K	1		
R57	27K	1		
R58	47K	1		
R59	22K			
R60	2200Ω			
R61	220Ω			
R62	3Ω (Cold)			
R63	220Ω			
R64	100K			
R65	100K			
R66	4.7meg			
R67	470K			
R68	6800Ω			
R69	1600Ω 5%			
R70	100K			
R71	100K			
R72	5600Ω			
R73	47K			
R74	100Ω			Note 1
R75	100Ω			
R76	10K	2		
R77	22K			
R78	2.2Ω			
R79	15Ω	2		
R80	4700Ω			
R81	1000Ω	1		
R82	1.5meg			
R83	1meg			
R84	2000Ω	10		
R85	1200	10		
R86	330K			

Note 1. Not used in some versions.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: HOFFMAN PART No.	Gramar PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	1st Video IF	762006	17-4534	17-4534	TV-131		VF-4	
L2	2nd Video IF	762017	17-4523	17-4523	TV-130	6219	VF-3	
L3	3rd Video IF	762017	17-4523	17-4523	TV-130	6219	VF-3	
L4	4th Video IF	762019	17-5004	17-5004	TV-128	6234		
L5	RF Choke		19-1004	19-1004	BC-585	4810		5.8uh ①
L6	Shunt Peaking Coil		19-3100	19-3100	TV-194	6118	VP-3	100uh
L7	Shunt Peaking Coil				TV-207	6156		820uh
L8	4.5MC Trap	762005	20-1004	20-1004	TV-151	1469 *	SF-3	
L9	Series Peaking Coil		19-4201	19-4201	TV-197	6154		220uh
L10	1st Sound IF	762005	20-1004	20-1004	TV-151	1469 *	SF-3	
L11	2nd Sound IF	760003	17-3495	17-3495	TV-113	6303	SF-2	
L12	Quadrature Coil	774001	20-1007	20-1007	TV-121	1480		

* Disregard tap. ① IRC Part #CLA.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.: PRI.	SEC.	REPLACEMENT DATA: HOFFMAN PART No.	Halldorson PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.	NOTES
L13	582		78 768018 ①	HS-5	TV-163	6210	H-102	HS-5	Horiz. Stab

① Ch. 344A uses Part #768017 in this application.

TRANSFORMER (POWER)

ITEM No	RATING: PRI	SEC. 1	SEC. 2	HOFFMAN PART No.	Halldorson PART No.	Merit PART No	Ram PART No.	Stancor PART No	Thordarson PART No	Triad PART No
T1	117V & 1.8A	570VCT & 270A	5V & 3A	716020						
	SEC. 3	SEC. 4	SEC. 5							
	6.3V & .6A	6.3V & 6.5A								

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: HOFFMAN PART No	Halldorson PART No	Merit PART No	Ram PART No	Rogers PART No	Stancor PART No	Thordarson PART No	Triad PART No
T2	Vert. Output	728010							
T3	Yoke-Horiz.(16MH) (110°)-Vert. (33.8MH) Rear Cover & Centering Device	790009	Y-48 1 2		Y-110 1 ③		DY-27A 1 2	Y-48 1 2	Y-60 4 YW-12 2 YC-110
T4	Horiz. Output	[redacted]	FLY-150 4 *		X166 *		HO-289 *	FLY-150 4 *	D-160 *

① Use original rear cover, centering device, and yoke damping network, if necessary.
② Use original yoke plug and connect same as original.
③ Connect yoke terminal #2 to yoke plug #3, yoke terminals #1 and #3 to yoke plug #5, yoke terminal #10 to yoke plug #8.
④ Drill new mounting hole(s).

* HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	Ram Replacement Connections	Rogers Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
8	5		5		5	5	8
6	4		4		4	4	4
5	3		3		3	3	3
3	1		1		1	1	1

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI	SEC.	REPLACEMENT DATA: HOFFMAN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No	Stancor PART No.	Thordarson PART No.	Triad PART No	NOTES
T5	5200Ω	3-4Ω	724035	24848	A-3028	AU-601	A-3677	24848	S-6X	

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V C IMP	REPLACEMENT DATA: HOFFMAN PART No.	QUAM PART No.	NOTES
SP1	3" x 5"	PM	3-4Ω	708908	35A05	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	HOFFMAN PART No.	REPLACEMENT DATA	
K1	Vert. Integrator	2200mmf, 4700mmf, 4700mmf, 8200Ω, 8200Ω, 22K		Aerovox Centralab Cornell-Dubilier Sprague	PA-110 PC-100 115TMI V-1

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA: HOFFMAN PART No.: FUSE	HOLDER	LITTELFUSE PART No.: FUSE	HOLDER	BUSS PART No.: FUSE	HOLDER
M1	3AG	3.2A 125V S/B P/T			313 03.2 (3.2A-125V-S/B-P/T)		MDV 3 2/10	

MISCELLANEOUS

ITEM No	PART NAME	HOFFMAN PART No	NOTES
M2	Tuner	710019	VHF

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

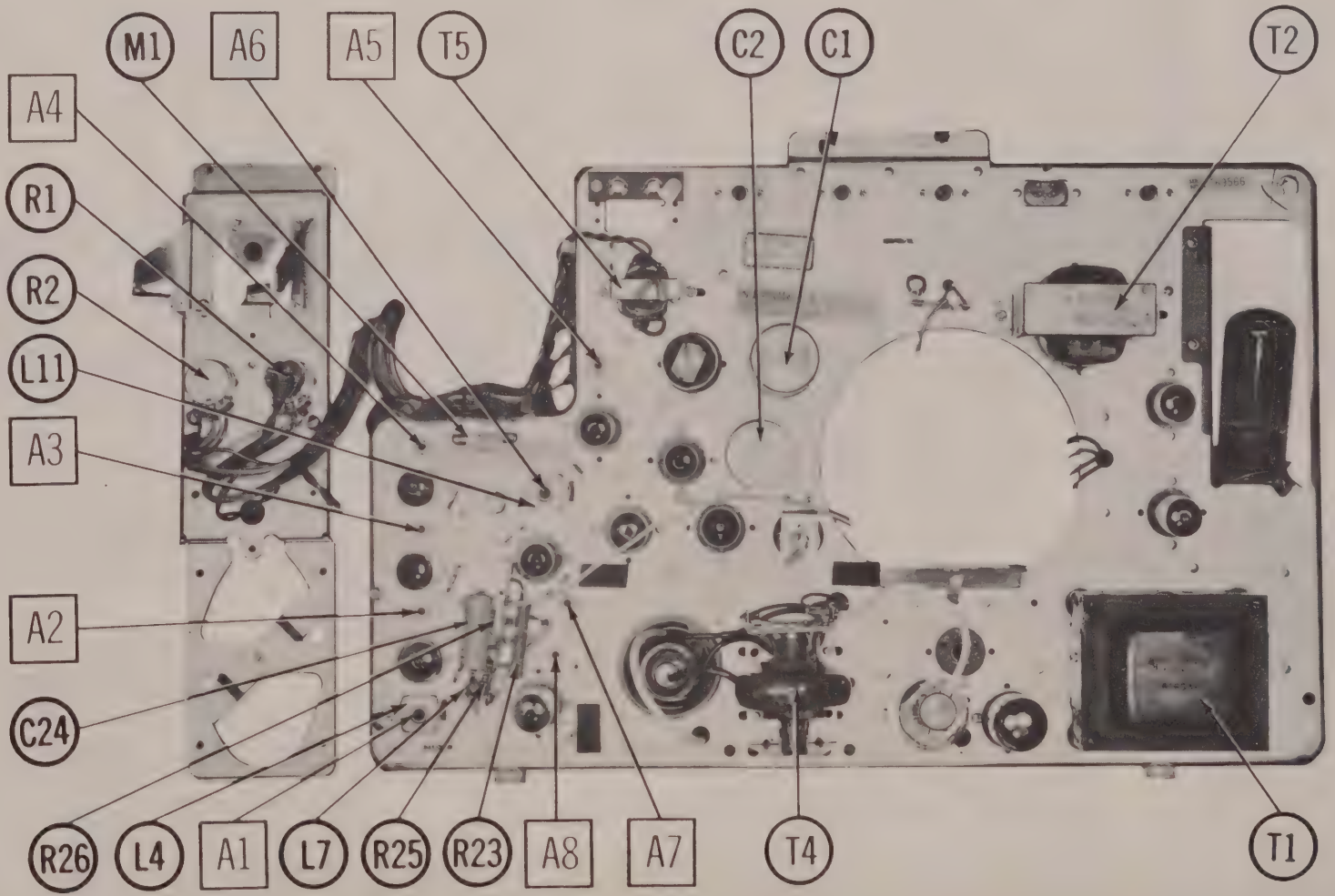
NAME	PART NO.	DESCRIPTION
Safety Glass & Mask	408005	Models K1327, W1327, M1327, B1327, P1327
Safety Glass	430009	Models K1331, W3571, M3571, B3571, SP3571, W3561, M3561, B3561, SP3561
Safety Glass	430010	Models W1331, M1331, B1331, SP1331
Mask	400008	Models W1331, M1331, B1331, SP1331
Mask	400009	Models W3561, M3561, B3561, SP3561, W3571, B3571, SP3571, K1331, M3571
Escutcheon	450004	All Models except K1331, K1327, W1327, M1327, B1327, P1327
Escutcheon	450001	Model K1327
Escutcheon	450003	Model K1331
Escutcheon	450002	Models W1327, M1327, B1327, P1327
Knob	480069	Channel Selector
Knob	488033	Fine Tuning
Knob	508018	Off-On-Volume, Brightness
Knob	518022	Contrast, Vert. Hold

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

HOFFMAN MODELS 1327 Series, 1331 Series, 3561 Series, 3571 Series (Ch. 344, A)

FOLDER 1



CHASSIS TOP VIEW

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: A1 thru A8 — GENERAL CEMENT #8606, 8606L, 8282, 9295; WALSCO #2526, 2543, 2544, 2545
Mixer Plate Coil .. GENERAL CEMENT #9296, 9297; WALSCO #2546, 2547

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt bias supply to point (A). Positive to chassis.
Set the Contrast fully counterclockwise.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough generator output to provide a usable indication on VTVM.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.005mfd	Place a thin insulated metal strip between the Mixer-Osc. tube (V202), and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	Not used	44.25MC (Unmod)	Any non-interfering channel	USE VTVM DC probe thru 10K to point (B). Common to chassis. (Across Video Det. load)	A1	Adjust for maximum deflection.
2.	"	"	"	45.0MC	"	"	A2	"
3.	"	"	"	43.5MC	"	"	A3	"
4.	"	"	"	42.7MC	"	"	Mixer Plate Coil & A4	Adjust Mixer Plate Coil for MINIMUM and A4 for maximum deflection.
5.	"	"	"	45.2MC	"	"	Mixer Plate Coil	Adjust for maximum deflection.
6.	"	"	44.0MC (10MC Swp)	42.5MC 45.0MC 45.75MC	"	Vert. Amp. thru 10K to point (B). Low side to chassis.		Check for response similar to Fig. 1. If necessary, retouch A1 for proper tilt, A2 and Mixer Plate coil for proper placement at 45.75MC marker. A3 and A4 for placement of the 42.5MC marker on the curve.

SOUND IF ALIGNMENT

Tune in a TV signal and adjust controls for a normal picture. Reduce the signal strength by connecting an adjustable attenuator in series with the antenna lead.
Attenuate the signal until a hiss is heard in the sound similar to super-regeneration.
Adjust A5, A6 and A7 for maximum undistorted sound.

4.5MC TRAP ALIGNMENT

Tune in a TV station and adjust the Fine Tuning until a beat pattern is noted in the picture. Adjust A8 until the horizontal scanning lines are smooth and continuous.

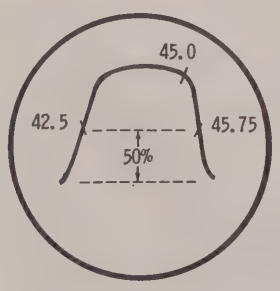


FIG. 1

ALIGNMENT INSTRUCTIONS

TUNER ALIGNMENT

Suggested Alignment Tools:	GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987 WALSCO #2531

VHF OSCILLATOR ALIGNMENT

The individual channel adjustment screws are accessible one at a time, thru a hole in the front of the tuner, as the Channel Selector is rotated. Set the Fine Tuning to the center of its range and switch to channel to be adjusted. Adjust for best picture and sound.

VHF RF AND MIXER ALIGNMENT

This portion of the tuner has been properly aligned at the factory and is very stable. Alignment of this portion should not be attempted in the field.

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amplifier	6CY5	

ITEM No.	USE	TYPE	NOTES
V202	Mixer-Osc.	6CG8A	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	HOFFMAN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	10				DI-10	DD-100	L10Q1	CNO-410	5GA-Q1	
C202	5.6								5TCUB-Q5.6S *	
C203	1000				EF-001	MFT-1000			503C-D1	
C204	10				DI-10	DD-100	L10Q1	CNO-410	5GA-Q1	
C205	1000				EF-001	MFT-1000			503C-D1	
C206	1000				BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C207	56									
C208	1000				EF-001	MFT-1000			503C-D1	
C209	1000				EF-001	MFT-1000			503C-D1	
C210	10				DI-10	DD-100	L10Q1	CNO-410	5GA-Q1	
C211	10				DI-10	DD-100	L10Q1	CNO-410	5GA-Q1	
C212	10				DI-10	DD-100	L10Q1	CNO-410	5GA-Q1	
C213	1000				EF-001	MFT-1000			503C-D1	
C214	1000				BPD-001	DD-103	BYA10D1M	B-210	5HK-D1	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		HOFFMAN PART No.	NOTES
	OHMS	WATT		
R201	10K			
R202	22K			
R203	220K			
R204	2200Ω			
R205	47K			

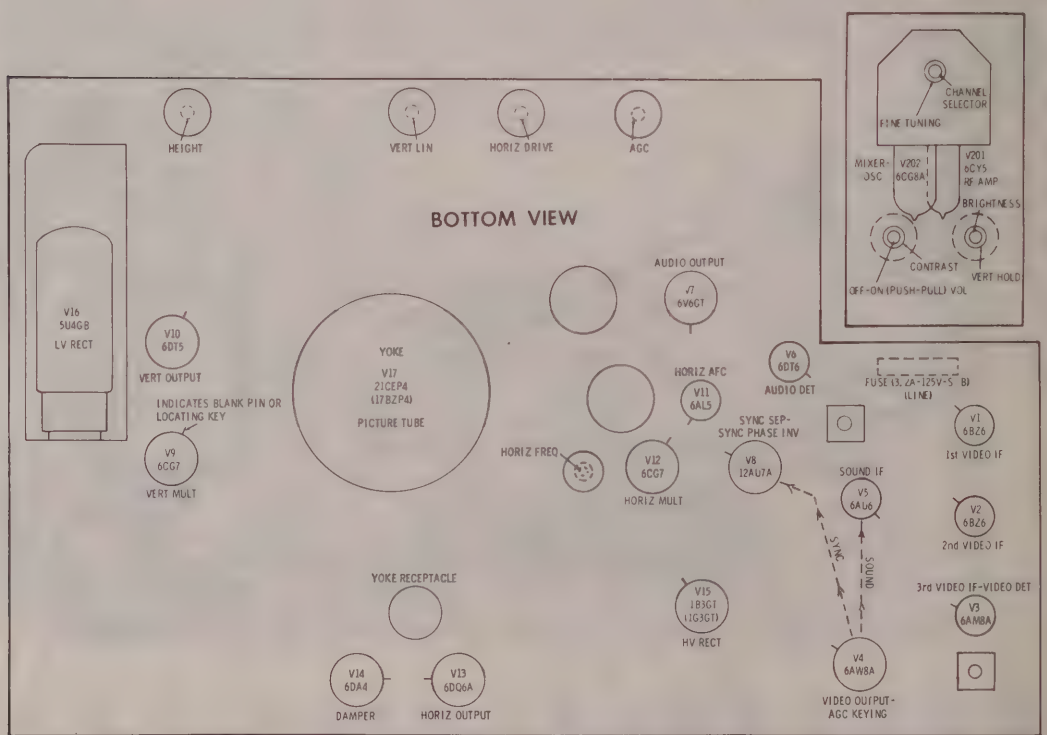
ITEM No.	RATING		HOFFMAN PART No.	NOTES
	OHMS	WATT		
R206	10K			
R207	10K			
R208	15K			
R209	5600Ω			
R210	150K			

CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	• 35K	47Ω	.1Ω	0Ω	†6800Ω	†6800Ω	0Ω		
V2	6BZ6	•35K	47Ω	.1Ω	0Ω	†6800Ω	†6800Ω	0Ω		
V3	6AM8A	150Ω	.1Ω	†24K	.1Ω	0Ω	†1100Ω	.1Ω	4700Ω	0Ω
V4	6AW8A	†120Ω	†950Ω	480K	650K	650K	•70Ω	4700Ω	†22K	†5700Ω
V5	6AU6	47K	Ω	.1Ω	0Ω	†7700Ω	†25K	0Ω		
V6	6DT6	5Ω	820Ω	.1Ω	0Ω	ǂ840K	†7700Ω	560K		
V7	6V6GT	NC	0Ω	†420Ω	†2100Ω	0Ω	NC	.1Ω	390Ω	
V8	12AU7A	†4500Ω	†120K	4500Ω	.1Ω	.1Ω	†120K	2.5meg	0Ω	0Ω
V9	6CG7	†68K	60K	1000Ω	0Ω	.1Ω	ǂ700K	•2meg	1000Ω	0Ω
V10	6DT5	†3300Ω	NC	•1meg	0Ω	.1Ω	•1meg	0Ω	NC	†420Ω
V11	6AL5	15Ω	15Ω	.1Ω	0Ω	4.8meg	0Ω	4.8meg		
V12	6CG7	†7900Ω	5.2meg	1500Ω	0Ω	.1Ω	†100K	100K	1500Ω	0Ω
V13	6DQ6A	NC	0Ω	NC	†10K	1meg	TP	.1Ω	0Ω	TOP CAP †10Ω
V14	6DA4	NC	NC	INF	NC	†120Ω	NC	.1Ω	0Ω	
V15	1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ǂ335Ω
V16	5U4GB	NC	¶	NC	20Ω	NC	21Ω	NC	¶	
V17	21CEP4	0Ω	22K	ǂ22K	†2100Ω	NC	22K	• 300K	.1Ω	
V201	6CY5	800K	0Ω	0Ω	.1Ω	†3600Ω	†13K	0Ω		
V202	6CG8A	15K	†13K	0Ω	.1Ω	0Ω	†5800Ω	†50K	0Ω	220K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 280V SOURCE.
ǂ MEASURED FROM PIN 3 OF V14.
NC NO CONNECTION.
TP TIE POINT.



TUBE PLACEMENT CHART

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

MOTOROLA MODEL
14P14-1 (Ch. TS-434)

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

MOTOROLA MODEL
14P14-1 (Ch. TS-434)

MOTOROLA MODEL
14P14-1 (Ch. TS-434)

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

MOTOROLA MODEL 14P14-1 (Ch. TS-434)

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 6 metal screws holding rear cover. Remove the rear cover.
2. Remove 6 push-on type knobs from the side.
3. Remove 2 chassis bolts from the bottom of the cabinet.
4. Remove the chassis bolt located between the Local-Distance control and the service test receptacle.
5. Remove speaker leads, yoke socket and the picture tube socket.
6. Tilt the top of the chassis forward and to the left. Pull bottom right side of the chassis toward the rear of the cabinet. Remove the HV lead.
7. Remove chassis by tilting top forward and removing the right bottom corner first.

CAUTION

ONE SIDE OF AC LINE CONNECTED TO CHASSIS.

Care should be exercised when connecting test equipment or physically contacting chassis. Isolation devices employed by manufacturer should be checked and properly connected before returning receiver to owner.

TRADE NAME	Motorola MODEL 14P14-1 CHASSIS TS-434
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois
TYPE SET	Television Receiver
TUBES	Sixteen
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 110 Watts, 1.14 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

Remove 2 metal screws from bottom of mask.
Pull mask out at the bottom and lift mask off the cabinet.

FUSE

One fuse is used for low voltage power supply protection. (For location, see "Tube Placement Chart".)

TUNER OSCILLATOR ADJUSTMENTS

To touch-up the VHF Oscillator, it is necessary to remove the chassis. (See "Disassembly Instructions".)

AGC

The AGC may be varied by means of a Local-Distance control. (For location, see "Tube Placement Chart".)

FOCUS

The focus may be varied by the position of a strap on the base of the picture tube.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

Coarse adjustment of the Horizontal Hold is accomplished by the proper setting of the Horizontal Frequency slug (B1). (For location, see "Tube Placement Chart".)

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

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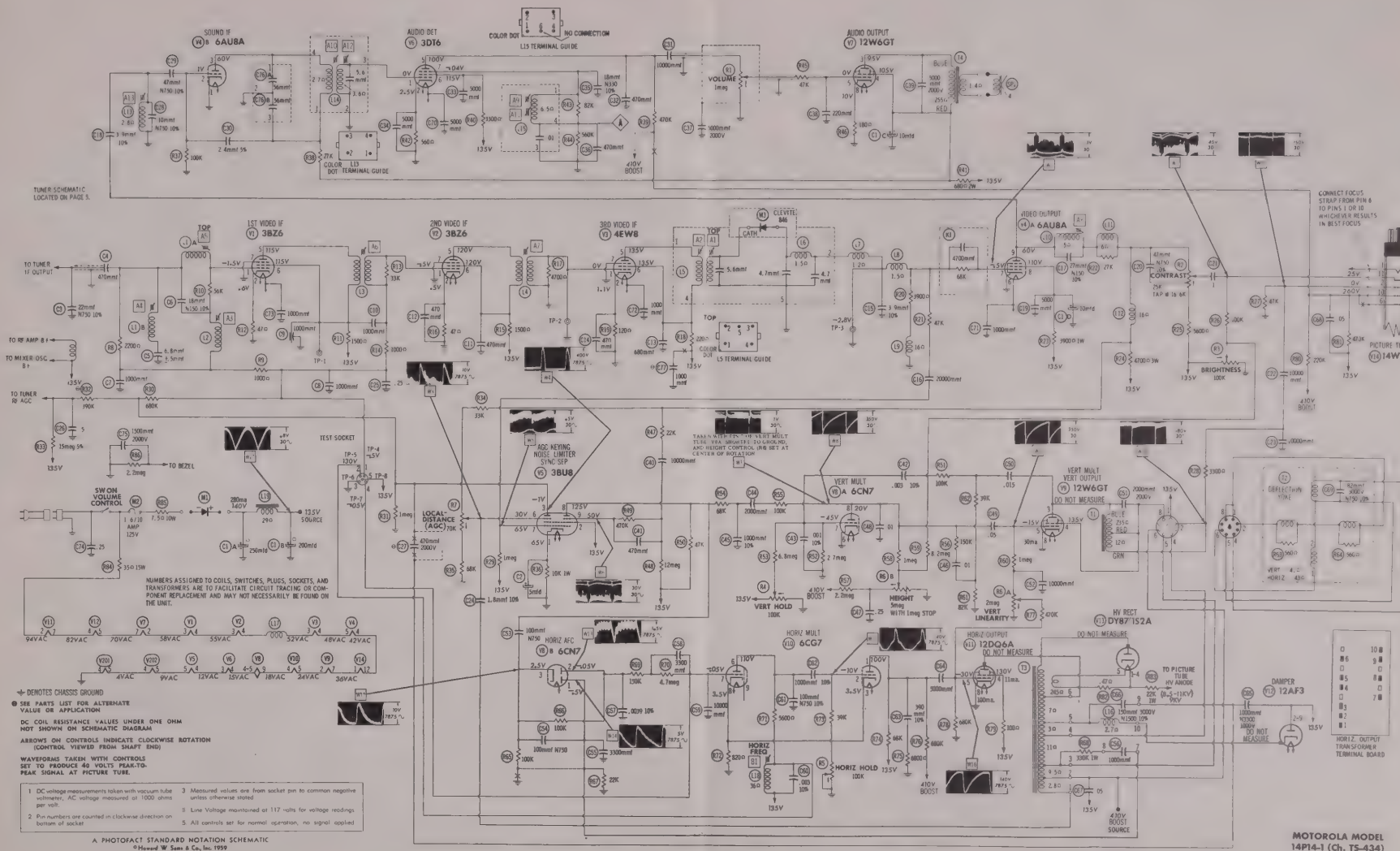
JA460

MOTOROLA MODEL 14P14-1 (Ch. TS-434)
MOTOROLA MODEL 14P14-1 (Ch. TS-434)
SET 455 FOLDER 2


SOUND IF
AUDIO DET
AUDIO OUTPUT
COLOR DOT
NO CONNECTION
L15 TERMINAL GUIDE
VOLUME
TUNER SCHEMATIC LOCATED ON PAGE 5.
1ST VIDEO IF
2ND VIDEO IF
3RD VIDEO IF
VIDEO OUTPUT
CONNECT FOCUS STRAP FROM PIN 6 TO PINS 1 OR 10 WHICHEVER RESULTS IN BEST FOCUS
CONTRAST
BRIGHTNESS
PICTURE TUBE
TO TUNER IF OUTPUT
TO RF AMP B+
TO MIXER-OSC B+
TO TUNER RF AGC
TEST SOCKET
TO BEZEL
SW ON VOLUME CONTROL
AGC KEYING NOISE LIMITER SYNC SEP
LOCAL DISTANCE (AGC)
VERT MULT
VERT OUTPUT
VERT HOLD
HEIGHT
VERT LINEARITY
HV RECT
HORIZ MULT
HORIZ AFC
HORIZ OUTPUT
HORIZ FREQ
HORIZ HOLD
DAMPER
TO PICTURE TUBE HV ANODE
HORIZ. OUTPUT TRANSFORMER TERMINAL BOARD
410V BOOST
410V BOOST SOURCE
135V SOURCE
DO NOT MEASURE
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
DENOTES CHASSIS GROUND
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 40 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
1 DC voltage measurements taken with vacuum tube voltmeter, AC voltage measured at 1000 ohms per volt.
2 Pin numbers are counted in clockwise direction on bottom of socket
3 Measured values are from socket pin to common negative unless otherwise stated
5 Line Voltage maintained at 117 volts for voltage readings
5 All controls set for normal operation, no signal applied
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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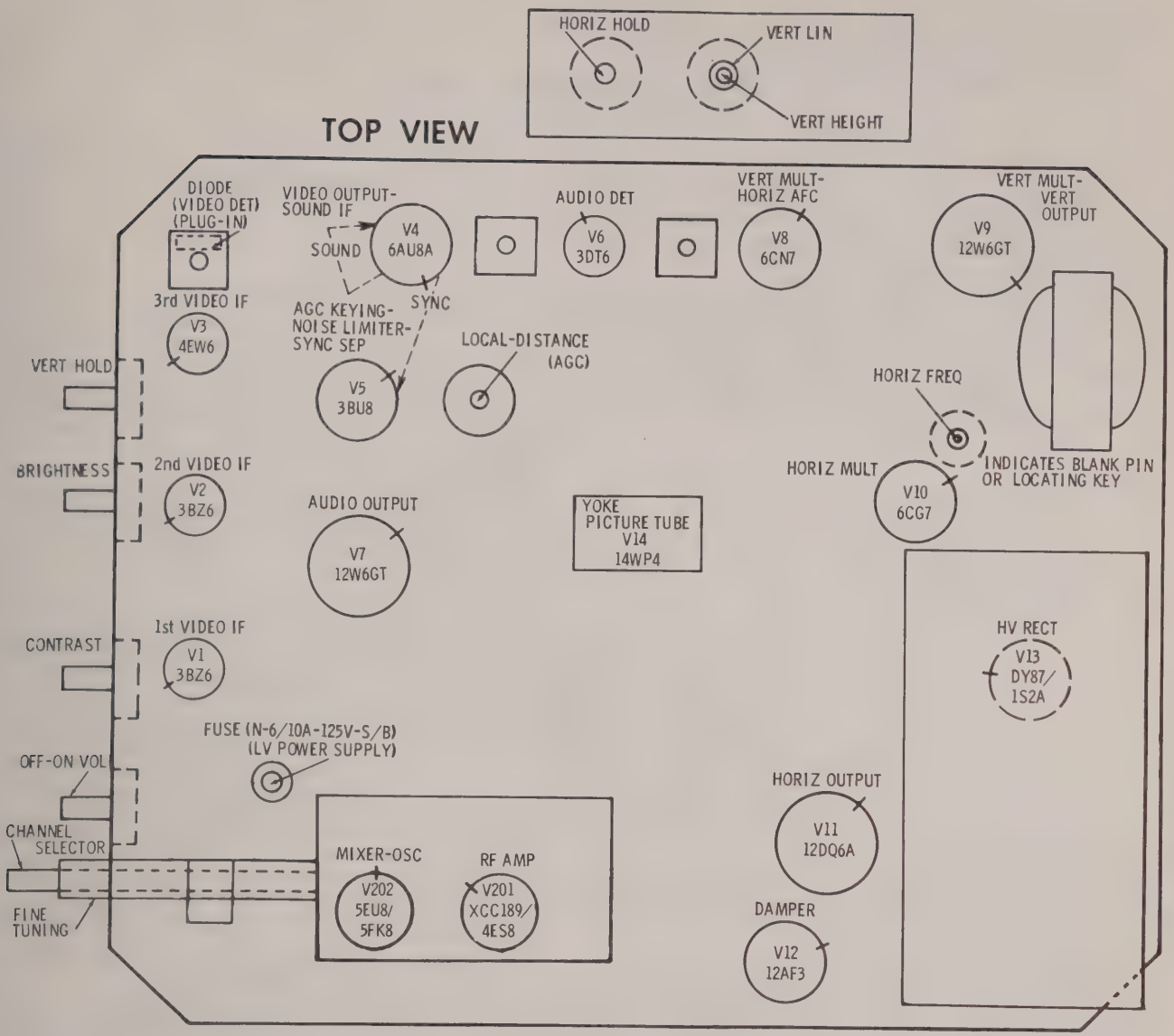
MOTOROLA MODEL
14P14-1 (Ch. TS-434)

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

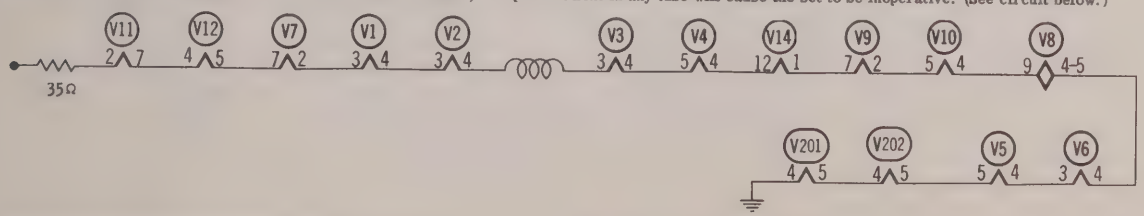
POWER SUPPLY FAILURE
No raster, no sound Fuse (B+), Rectifier (B+)

SWEEP FAILURE
No raster, has sound V10, V11, V12, V13, V14, Rectifier (B+)
No vertical deflection V8, V9
Poor vert. linearity or foldover V8, V9
Poor horiz. linearity or foldover V10, V11, V12
Narrow picture Rectifier (B+), V10, V11, V12
Vert. off freq. V8, V9
Horiz. off freq. V8, V10

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V14
Has pic, no sound V4, V6, V7
Overloaded picture V5

SYNC FAILURE
No vert. sync V8
No horiz. sync V8, V10
No vert. or horiz. sync V5

This receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative. (See circuit below.)



ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Use an ISOLATION TRANSFORMER TO PROTECT the Test Equipment.
The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: A1 thru A13 ..... GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 543, 544, 545
Mixer Plate Coil..GENERAL CEMENT #9296, 9297
WALSCO #2546, 2547

VIDEO IF ALIGNMENT

Disable the local oscillator by shorting the grid to chassis.
Unplug the deflection yoke to eliminate RF interference radiation.
Connect a 1000Ω 40 watt resistor from TP-8 to chassis.
Connect the negative lead of a 4 volt bias supply to TP-4. Positive to chassis.
Set Contrast fully counterclockwise.
Connect a clip lead across the antenna terminals.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection..
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough generator output to provide a usable indication on VTVM.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001mfd	High side to TP-2. Low side to chassis.	44.0MC (10MC Swp)	45.75MC	13	Vert. Amp. thru 47K to TP-3. Low side to chassis. (Across Video Det. load)	A1, A2	Adjust for equal peaks and marker location as shown in Fig. 1. Use maximum core separation.
2.		Place a thin insulated metal strip between the Mixer-Osc. tube (V202), and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	"	47.25MC 41.25MC	"	"	A3, A4	Adjust A3 to place 47.25MC in trap notch as in Fig. 2. Adjust A4 to place 41.25MC marker in other notch. Remove bias for this step if necessary.
3.		"	"	41.25MC 42.25MC 45.75MC 47.25MC	"	Vert. Amp. thru 47K to TP-1. Low side to chassis.	Mixer Plate Coil, & A5	Adjust for response curve similar to Fig. 3. Mixer Plate Coil affects center of curve and A5 affects outside peaks. If a suckout occurs, detune A6.
4.		"	"	42.25MC 45.75MC	"	Vert. Amp. thru 47K to TP-3. Low side to chassis.	A6, A7	Adjust for maximum gain and symmetry of response similar to Fig. 4 with markers as shown. A6 affects 42.25MC marker and A7 affects 45.75MC marker. Peak with slugs nearest chassis. If necessary, retouch Mixer Plate Coil, A6 and A7, for desired response.

4.5MC TRAP ALIGNMENT

Tune in a local TV signal and advance the Contrast. Adjust the Fine Tuning until a 4.5MC beat interference is visible in the picture.
Adjust A8 until the horizontal scanning lines are smooth and continuous.

SOUND IF ALIGNMENT

Tune in a strong TV signal and adjust all controls for a normal picture and sound. Connect the DC probe of a VTVM to point (A). Common to chassis. A9 and A10 are preset at the factory so that the slugs are near the top of the coil form. If these have been accidentally changed, reset near the top. Adjust A11 for maximum deflection. Of the two peaks, select the one resulting in the highest VTVM reading. Retouch for maximum volume. Reduce the signal strength (by disconnecting the antenna lead or connecting an adjustable attenuator in series with the antenna) until a strong hiss is heard in the sound. Adjust A12 and A13 for maximum sound with MINIMUM distortion.
If sound is not clear at this point, repeat the above procedure.

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGE 6

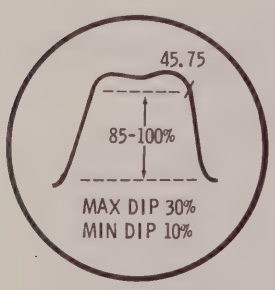


FIG.1

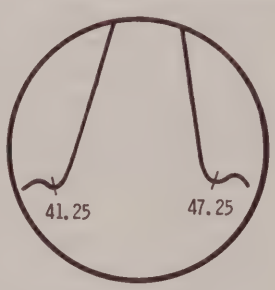


FIG.2

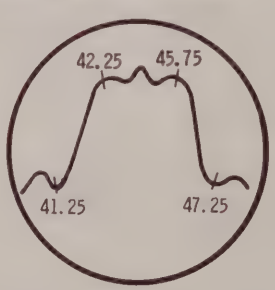


FIG.3

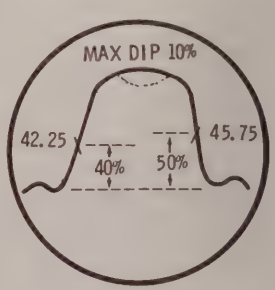
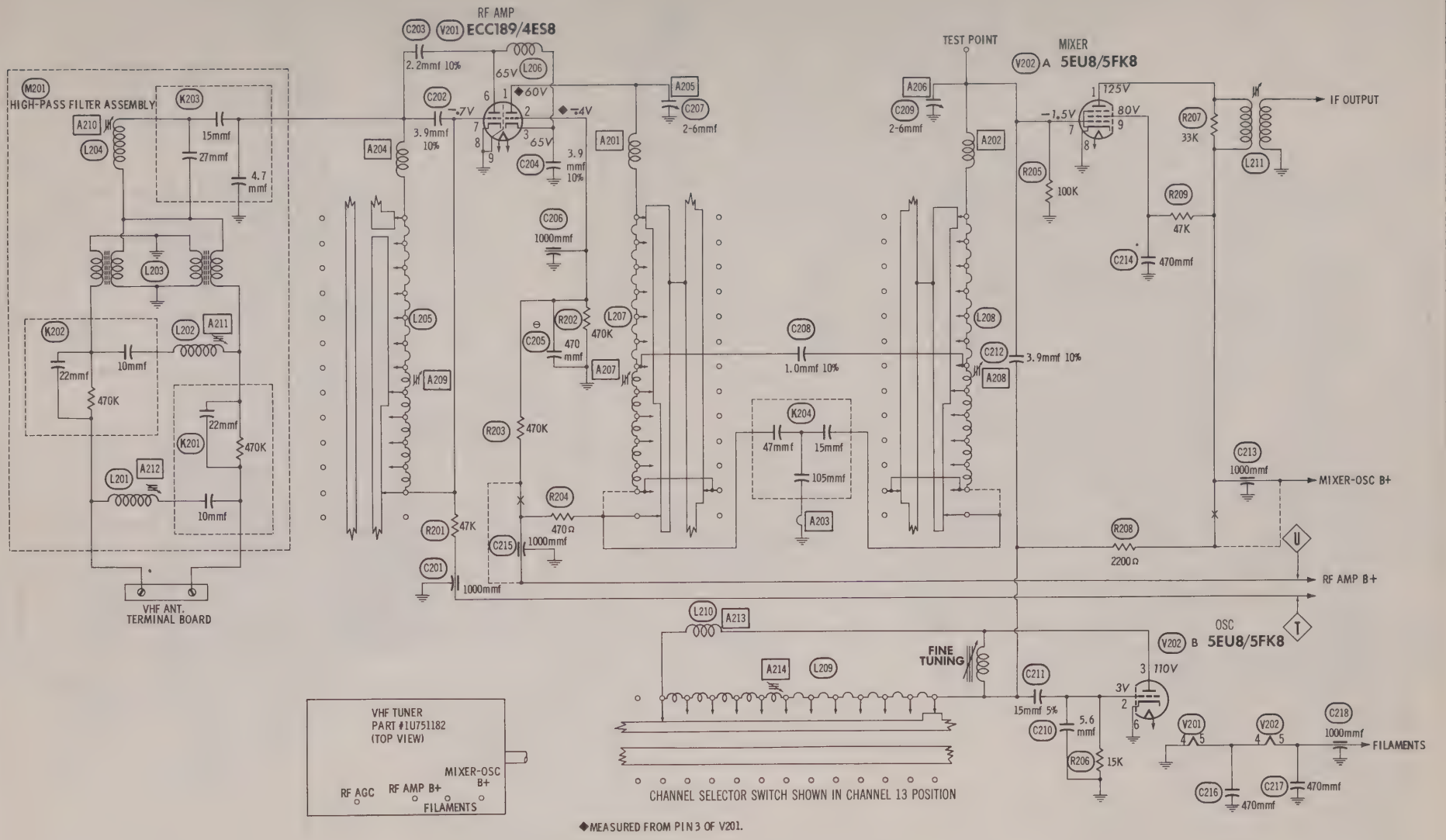


FIG.4



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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VHF TUNER 1U751182 (TT-121A)

MOTOROLA MODEL 14P14-1 (Ch. TS-434)

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Use an ISOLATION TRANSFORMER TO PROTECT the Test Equipment.
The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Connect a clip lead from point (T) to chassis.
Remove the yoke plug to prevent radiation interference. Connect 1000Ω 40W resistor from point (U) to chassis.
Preset A201 and A202 by setting so that the top of screw are .35 inch above tuner chassis.
Suggested Alignment Tools: A201, A202..... GENERAL CEMENT #5000, 5003, 8276, 8290
WALSCO #2512, 2525
A203 thru A209.. GENERAL CEMENT #9296, 9297
WALSCO #2546, 2547

RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K to point (V). Low side to chassis.	A201, A202, A203, A204	Adjust for maximum gain and symmetry of response similar to Fig. 201 with markers as shown. A201 controls position of 211.25MC and A202 controls position of 215.75MC marker. A203 controls bandwidth and A204 is adjusted for maximum gain with MINIMUM tilt.
2.	"	"	177MC	175.25MC 179.75MC	7	"	A205, A206	Adjust for maximum gain and symmetry of response similar to Fig. 201 with markers as shown. Adjust A205 for proper marker positions and A206 for MINIMUM tilt.
3.	"	"	85MC	83.25MC 87.75MC	6	"	A207, A208, A209	Adjust for maximum gain and symmetry of response similar to Fig. 201 with markers as shown. Adjust A207 for proper placement of 83.25MC marker , A208 for proper placement of 87.75MC marker and A209 for maximum gain and MINIMUM tilt.
4.	"	"	"	94 MC	"	"	A210	Adjust for MINIMUM response at 94MC marker or until it just starts to affect the high side of the response curve.
5.	"	"	79MC	77.25MC 81.75MC	5	"		Check for response similar to Fig. 201. It may be necessary to make compromise adjustments of A207, A208 and A209
			69MC	67.25MC 71.75MC	4			
			63MC	61.25MC 65.75MC	3			
			57MC	55.25MC 59.75MC	2			
6.	"	"	57MC	43.5MC 45.5MC	2		A211, A212	If necessary, adjust A211 for MINIMUM response at 45.5MC and A212 for MINIMUM response at 43.5MC. Retouch either or both for flat response consistent with MINIMUM trap frequency amplitude.

OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the Fine Tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	215.75MC	13	Vert. Amp. thru 47K across Video Det. load.	A213	Adjust to place marker in trap notch as in Fig. 202.
8.	"	"	207MC	209.75MC	12	"		Check to make sure that marker falls in trap notch for each channel. If necessary, make compromise adjustment of A213.
			201MC	203.75MC	11			
			195MC	197.75MC	10			
			189MC	191.75MC	9			
			183MC	185.75MC	8			
			177MC	179.75MC	7			
9.	"	"	85MC	87.75MC	6	"	A214	Adjust to place marker in trap notch as in Fig. 202.
10.	"	"	79MC	81.75MC	5	"		Check to make sure that marker falls in trap notch for each channel. If necessary, make compromise adjustment of A214.
			69MC	71.75MC	4			
			63MC	65.75MC	3			
			57MC	59.75MC	2			

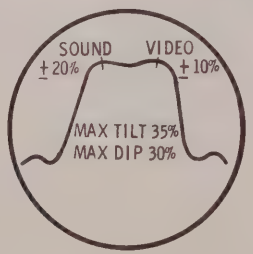
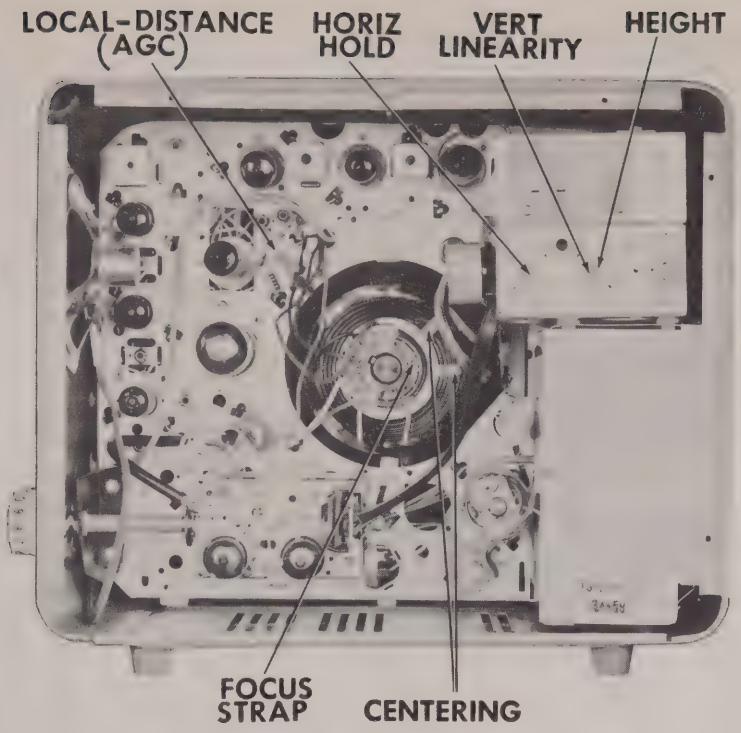


FIG. 201

FIG. 202



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

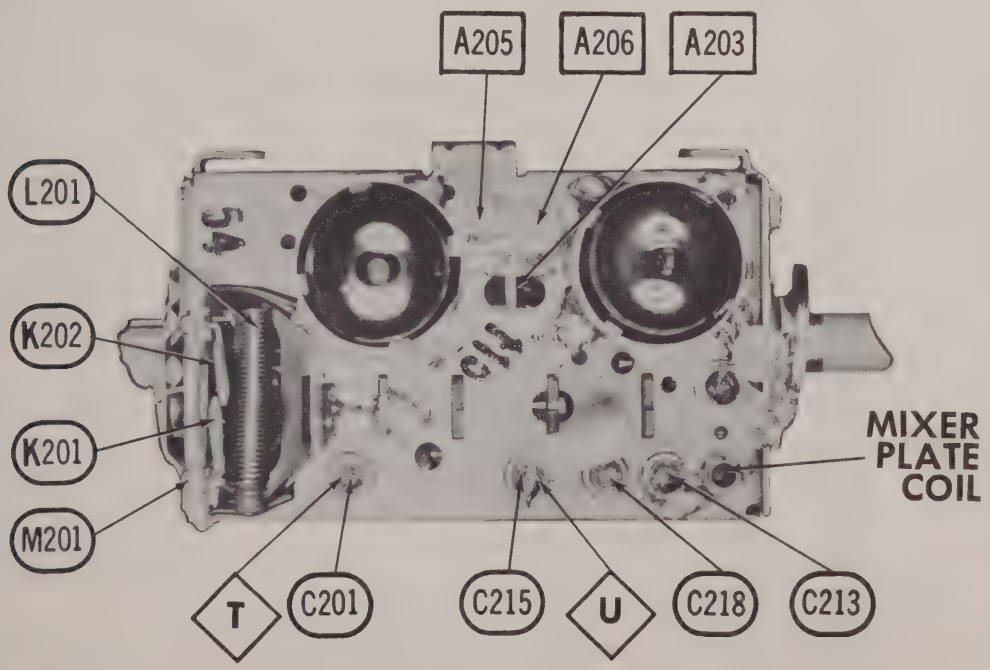
Turn the set on and tune in a TV station, preferably with a test pattern. Adjust the Brightness and Contrast controls for a normal picture.

Short out the AFC voltage by connecting a clip lead from TP-7 to chassis. Connect a .1mfd, 400 volt capacitor from TP-5 to chassis.

Adjust Horizontal Hold to the point where the picture is almost stable horizontally.

Remove the capacitor from TP-5 and adjust the Horizontal Frequency slug (B1) to the point where the picture is almost stable horizontally.

Remove the clip lead from TP-7 and chassis. Adjust the Horizontal Hold control until the picture is synchronized horizontally.



TUNER—TOP VIEW

SET 455 FOLDER 2

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	1st Video IF Amp	3BZ6	
V2	2nd Video IF Amp	3BZ6	
V3	3rd Video IF Amp	4EW6	
V4	Video Output-Sound IF Amp	6AU8A	
V5	AGC Keying-Noise Limiter Sync Sep	3BU8	
V6	Audio Det	3DT6	
V7	Audio Output	12W6GT	
V8	Vert Mult.-Horiz. AFC	6CN7	
V9	Vert. Mult.-Vert. Output	12W6GT	
V10	Horiz. Mult.	6CG7	
V11	Horiz. Output	12D.Q6A	
V12	Damper	12AX3	
V13	HV Rect	DY87/132A	

PICTURE TUBE

ITEM No	REPLACEMENT DATA				NOTES
	MOTOROLA PART No	GENERAL ELECTRIC PART No	RCA PART No	SYLVANIA PART No	
V14	14WP4		14WP4/ 14ZP4 ①	14WP4/ 14ZP4 ②	① Aluminized ② Silver Screen "85"

ELECTROLYTIC CAPACITORS

ITEM No	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	MOTOROLA PART No	AEROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	250	150	23K744100	XC0128	WT320	CGB-T-1015	TVLS-4453*		
B	200	150		BBR10-150	TC42	TD-10-150			
C	10	150							
D	10	150							
C2	5	150	23K710781	SRE150V5	NLW5-150	TC-40	TD-4-150	TVA-1403	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	MOTOROLA PART No	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	22		N750 10%	21R120539	N750-D1 22	DTN-22	C10G22U	CN7-423	5TCU-Q22S 10% *	
C4	470			21R14554	BPD-00047	DD-47I	BYA10T47	B-347	5GA-T47	
C5	6.8		± .5mmf	21R126576	NPO-D1 6.8	DTZ-6R8		CNO-568	5TCCB-V68S* ± .5mmf	
C6	18		N150 10%	21R120578						
C7	1000			21R11538	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C8	1000			21R11536	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C9	1000			21K737626	EF-001	MFT-1000			50SC-D1	
C10	1000			21R11536	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C11	470			21R410121	BPD-00047	DD-47I	BYA10T47	B-347	5GA-T47	
C12	470			21R410121	BPD-00047	DD-47I	BYA10T47	B-347	5GA-T47	
C13	680			21K746753	BPD-00068	DD-68I	BYA10T68	B-368	5GA-T47	
C14	470			21D746761	BPD-00047	DD-47I	BYA10T47	B-347	5GA-T47	
C15	5.9		10%	21R115953			C10V4C		5TCCB-V39S 10% *	
C16	20000			21K741952	BPD-02	DD-203	BYB803	B-120	5HK-D2	
C17	47		N150 10%	21R119896						
C18	2.9		10%	21R115963			C10V4C		5TCCB-V39S 10% *	
C19	5000			21R115313	BPD-005	DD-502	BYA10D5	B-350	5HK-D5	
C20	47		N750 10%	21R114207	N750-D1 47	DTN-47	C10Q47U	CN7-447	5TCU-Q47S 10% *	
C21	1	400		21R121006	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C22	10000			21R121946	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C23	10000			21R121946	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C24	1.8		10%	21R115961					5TCCB-V18S 10% *	
C25	25	100		8K124570	P288N-25		CUB2P25	GEM-3025	2TM-P25	
C26	5	100		8K123979	P288N-5		CUB2P5	GEM-405	2TM-P5	
C27	470	2000		21R121478	HVD-30-470	DD30-471	HVB20T47	2HV-347	20GA-T47	①
C28	10		N750 10%	21R12114	N750-D1 10	DTN-10	C10Q1U	CN7-410	5TCU-Q1S 10% *	
C29	47		N750 10%	21R114207	N750-D1 47	DTN-47	C10Q47U	CN7-447	5TCU-Q47S 10% *	
C30	3.4		5%	21K837562					5TCCB-V34S 5% *	
C31	10000			21R482726	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C32	470			21D746781	BPD-00047	DD-47I	BYA10T47	B-347	5GA-T47	
C33	5000			21K738298	BPD-005	DD-502	BYA10D5	B-350	5HK-D5	
C34	5000			21R115313	BPD-005	DD-502	BYA10D5	B-350	5HK-D5	
C35	18		N330 10%	21R125631						
C36	470			21D746761	BPD-00047	DD-47I	BYA10T47	B-347	5GA-T47	
C37	5000	2000		21R120093		DD30-502	HVC20D5	GEM-3015	20HK-D5	
C38	230			21R410115	BPD-00022	DD-221	L10T23	B-322	5GA-T22	
C39	5000	2000		21R119343		DD30-502	HVC20D5	GEM-3015	20HK-D5	
C40	10000			21R482726	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C41	470			21K121797	BPD-00047	DD-47I	BYA10T47	B-347	5GA-T47	
C42	.003	200	10%	8K740911	V84C4D33		PM6D1	GTM-2233	6TM-D3	
C43	.001	300	10%	8K740810	V84C4 DI		PM6D1	GTM-221	6TM-DI	
C44	2000			21R12106	BPD-002	DD-202	BYA10D2	B-230	5HK-D2	
C45	1000		10%	21R115386			PM6D1	JL-310	6TM-DI	
C46	.01	400		8K74633	P488N-01	D6-103	CUB4SI	GEM-411	4TM-SI	
C47	.25	600		8K123264	P688N-25		CUB6P25	GEM-6025	6TM-P25	
C48	.01	400		8K734633	P488N-01	D6-103	CUB4SI	GEM-411	4TM-SI	
C49	.05	400		8K121567	P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C50	.015	300		21R12256	P288N-015		CUB6S15	GEM-4115	6TM-S15	
C51	2000	2000		21R125899	HVD-30-2000	DD30-202	HVC20D2	2HV-222	BL-D20	
C52	100			21R482726	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C53	100		N750	21R400537	N750-D1 100	DTN-100	C10T1U	CN7-310	5TCU-T1	
C54	100		N750	21R400537	N750-D1 100	DTN-100	C10T1U	CN7-310	5TCU-T1	
C55	3300			21R120422	BPD-0033	DD-332	BYA10D3	B-233	5HK-D33	
C56	1000			21R75131	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C57	.0039	400	10%	8K125942			PM6D4	GTM-434	6TM-D4	
C58	3300			21R120422	BPD-0033	DD-332	BYA10D3	B-233	5HK-D33	
C59	1000			21K738700	BPD-001	DD-103	BYA10S1	B-110	5HK-S1	
C60	.003	200	10%	8K740911	V84C4D33		PM6D3	GTM-2233	6TM-D3	
C61	100		N750 10%	21R410036	N750-D1 100	DTN-100	C10T1U	CN7-310	5TCU-T1S 10% *	
C62	1000		10%	21K74592	1459-001		1R5DI	MCB255	MB-31	
C63	390		10%	21K748364	DL-390	D6-391	L10T39	MCB243	MB-339	
C64	5000			21K738298	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C65	1000	1000	N3300	21R129560						
C66	150	3000	N2500 10%	21R125423						
C67	.05	400		8R121567	P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C68	.05	400		8R121567	P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C69	83	3000	N750 10%	21R129505						
C70	5000			21K738298	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C71	1000			21R115386	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C72	1000			21R410127	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C73	1000			21R115388	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C74	.25	400		8K129679	P488N-25		CUB4P25	GEM-4025	4TM-P25	
C75	1500	2000		21R124421	HVD-30-1500	DD30-152	HVB20D15	2HV-215	20GA-D15	
C76A	56			51R751302	DI-56	DD-560	L10Q56	CNO-456	5GA-Q56	
B	56				DI-56	DD-560	L10Q56	CNO-456	5GA-Q56	
C77	1000			21R115386	BPD-001	DD-102	BYA10D1M	B-210	5GA-D1	②

① Not used in Ch. TS-434A-01 and higher. ② Not used in some versions.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1meg	½	18K751246	B-70-S	A47-1meg-Z	Q13-137	U53	Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req	
C	Switch			Not Req	SWE-12	76-1	US-26	Off-On
R2	25k	½	18K751385					Contrast, Tap @ 16.6K
R3A	100K	½	18K740680	B-40	B47-100K-S	Q11-128	TA15L	Brightness
B	Shaft			Not Req.	Not Req.	Not Req.	Not Req.	
R4A	100K	½	18K740680	B-40	B47-100K-S	Q11-128	TA15L	Vert. Hold
B	Shaft			Not Req.	Not Req.	Not Req.	Not Req.	
R5A	100K	½	18K741831	B-40	A47-100K-S	Q11-128	TA15L	Horiz. Hold
B	Shaft			Not Req.	K38-3	Not Req.	Not Req.	
R6A	2meg	½	18K741530	F1-67		■ Q4-917	Not Req.	Vert. Lin.
B	5meg	½		R2-83 *				Vert. Height, Stop ⑤ 1meg
R7	70K		18K746051					Local-Distance (AGC)

● "Concentrikit" Equivalent: K-5 Kit with Base Elements & Shafts: B11-139, P8-021 (Panel) B11-141, R11-038 (Rear) *

* Use 1meg resistor in series with left hand terminal.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		MOTOROLA PART No.	NOTES
	OHMS	WATT		
R8	2200Ω		6R6069	
R9	1000Ω		6R127960	
R10	56K		6K127541	
R11	1500Ω		6K127513	
R12	47Ω		6K127543	
R13	33K		6K127633	
R14	1000Ω		6K127960	
R15	1500Ω		6K127513	
R16	47Ω		6K127542	
R17	4700Ω		6K121647	
R18	220Ω		6K125471	
R19	180Ω		6K128236	
R20	3900Ω		6K121931	
R21	47K		6K121299	
R22	27K		6K119926	
R23	3900Ω	1	6R5618	
R24	4700Ω	3	17K751479	
R25	5800Ω		6K127005	
R26	100K		6K125534	
R27	47K		6K121299	
R28	3300Ω		6K121725	
R29	1meg		6K124494	
R30	680K		6K125229	
R31	1meg		6K124494	
R33	390K		6R5646	Note 1
R33	15meg 5%		6K125598	
R34	33K		6K127633	
R35	68K		6K124507	
R36	10K	1	6K122319	
R37	100K		6K122313	
R38	27K		6K121300	
R39	470K		6K121279	
R40	3300Ω		6K121725	
R41	680Ω	2	6R490015	
R42	560Ω		6K122802	
R43	82K		6K125179	
R44	560K		6K128228	
R45	47K		6K121687	
R46	180Ω		6K128953	
R47	22K		6K119935	

ITEM No.	RATING		MOTOROLA PART No.	NOTES
	OHMS	WATT		
R48	12meg		6R400334	
R49	470K		21K121279	
R50	47K		6K121299	
R51	100K		6K125534	
R52	2.7meg		6R488136	
R53	6.8meg		6K121933	
R54	68K		6K124507	
R55	100K		6K125534	
R56	150K		6K122322	
R57	2.2meg		6K127001	
R58	1meg		6K124494	
R59	6.2meg		6R5585	
R60	1meg		6K124494	
R61	82K		6K125179	
R62	39K		6K125535	
R63	560Ω		6K122802	
R64	560Ω		6K122802	
R65	100K		6K125534	
R66	100K		6K125534	
R67	22K		6K119935	
R68	330K	1	6K125793	
R69	150K		6K122322	
R70	4.7meg		6K121277	
R71	5600Ω		6K127005	
R72	820Ω		6K121302	
R73	39K		6K125535	
R74	68K		6K124507	
R75	6800Ω		6K119930	
R76	560K		6K128229	
R77	470K		21K121279	
R78	680K		6K128229	
R79	100Ω		6R6326	
R80	220K		6R6015	
R81	470K		21K121279	
R82	47Ω		17K488266	
R83	22K	1	6K121894	
R84	35Ω	15	17K739319	
R85	7.5Ω	10	17K744240	
R86	2.2meg		6K127001	

Note 1. Ch. TS-434A-02 and higher use 470K in this application (Part #6K125533)

COILS (RF-IF)

ITEM No	USE	REPLACEMENT DATA						NOTES
		MOTOROLA PART No	Gramer PART No	Meissner PART No	Merit PART No	Miller PART No	Ram PART No	
L1A	1st Video IF	24K750637						
B	41.25MC Trap							
L2	47.25MC Trap	24K750578	17-4538 ▲	17-4538 ▲	TV-153 ▲	6225 ▲		
L3	2nd Video IF	24K747587	17-4522	17-4522	TV-130	6219	VF-3	
L4	3rd Video IF	24K751248	17-4522	17-4522	TV-130	6219	VF-3	
L5	4th Video IF	24K751250						Includes M3
L6	Resonant Choke	24R119889						8.5uh
L7	Resonant Choke	24K748772						1.8uh ①
L8	Resonant Choke	24R119889						8.5uh
L9	Shunt Peaking Coil	24C749508	19-3500	19-3500	TV-203	6174	VP-8	500uh
L10	4.5MC Trap	24K739290	20-1004	20-1004	TV-151	1469 ▲	SF-3	
L11	Series Peaking Coil	24K751253	19-3180 *	19-3180 *	TV-184 *	6180 *	VP-5 *	180uh ②
L12	Shunt Peaking Coil	24C749508				1470-A ■		500uh
L13	1st Sound IF	24K751034						
L14	2nd Sound IF	24K751251						
L15	Quadrature Coil	24K751880						
L16	RF Choke	24K743727				4611		7.5uh
L17	Fil. Choke	24K743675	19-1001	19-1001	BC-562	4604		1.5uh

▲ Disregard tap. * Parallel with 27K resistor. ■ Remove shield. ① IRC Part #CLA. ② Includes R22.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MOTOROLA PART No.	Halldorson PART No.	Merit PART No	Miller PART No.	Ram PART No.	Thordorson PART No	
L18	36Ω		24K721065	HS-5	TV-163	6210	H-102	HS-5	Horiz. Stabilizer

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measurred)	DC RES.	INDUCTANCE (0 CURRENT 1000 ~)	MOTOROLA PART No	Halldorson PART No	Merit PART No	Ram PART No	Stancor PART No	Thordorson PART No	Triad PART No
L19	.280A	29Ω	.8 Hy.	25K751215	26C92	C-2896	F-801	C-2328	26C92	C-17X

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA							
		MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Rogers PART No	Stancor PART No.	Thordorson PART No.	Triad PART No
T1	Vert. Output	25K745051	26870 ①	A-2821	V316	VO38	A-8147	26S70 ①	A-131X
T2	Yoke-Horiz. (24MH) (90°)-Vert. (40MH)	24K747403	Y-15 ④ ⑤	MDF-97 ④	MG-8			Y-15 ④ ⑤	Y-45-2
	Rear Cover & Centering Device	59C721145							YC-1
	Yoke Retainer	42A736257							CL-1
	Yoke Clamp	42A734217							D-172
T3	Horiz. Output	24K751190							
	Primary Coil	24C742674							
	Secondary Coil	24C743047							

① Connect as autoformer.
② Drill new mounting hole(s).
③ Use 5.5 to 1 turns ratio.
④ Use original rear cover, leads, and plug. Connect same as original.
⑤ Use original horizontal damping capacitor if necessary.
⑥ Remove jumper from yoke terminals #1 and #4.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MOTOROLA PART No	Halldorson PART No	Merit PART No	Ram PART No	Stancor PART No	Thordorson PART No	Triad PART No	
T4	1800Ω	3-4Ω	25K751216	22S45	A-2928	AU-605	A-3332	22S45	S-2X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	
SP1	4"	PM	8-8Ω	50K751421	4A127.8	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	MOTOROLA PART No	REPLACEMENT DATA
K1	Video Coupling	4700mmf, 6KK	51K744975	

RECTIFIERS

ITEM No	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	MOTOROLA PART No	FEDERAL PART No	INTERNATIONAL PART No	SARKES TARZIAN PART No	SYLVANIA PART No	
M1	280A	48K751158 ½	HA504 ½	SD-500 ½	40K ½	SR500 ½	½ Silicon Type

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA						NOTES
			MOTOROLA PART No		LITTELFUSE PART No		BUSS PART No		
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER	
M2	N	1 6/10A 125V S/B	65K744238	8K744239	3330I 6 (N-1 6/10A-125V-S/B)	346016	N 1 6/10	HN 1 3/10 to 1 3/4	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		MOTOROLA PART No	CBS PART No	SYLVANIA PART No	
M3	Clevite 846	48K747380	1N60	1N60	Video Det (Clip-in)

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M4	Tuner	1U751163	VHF (TT-121)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

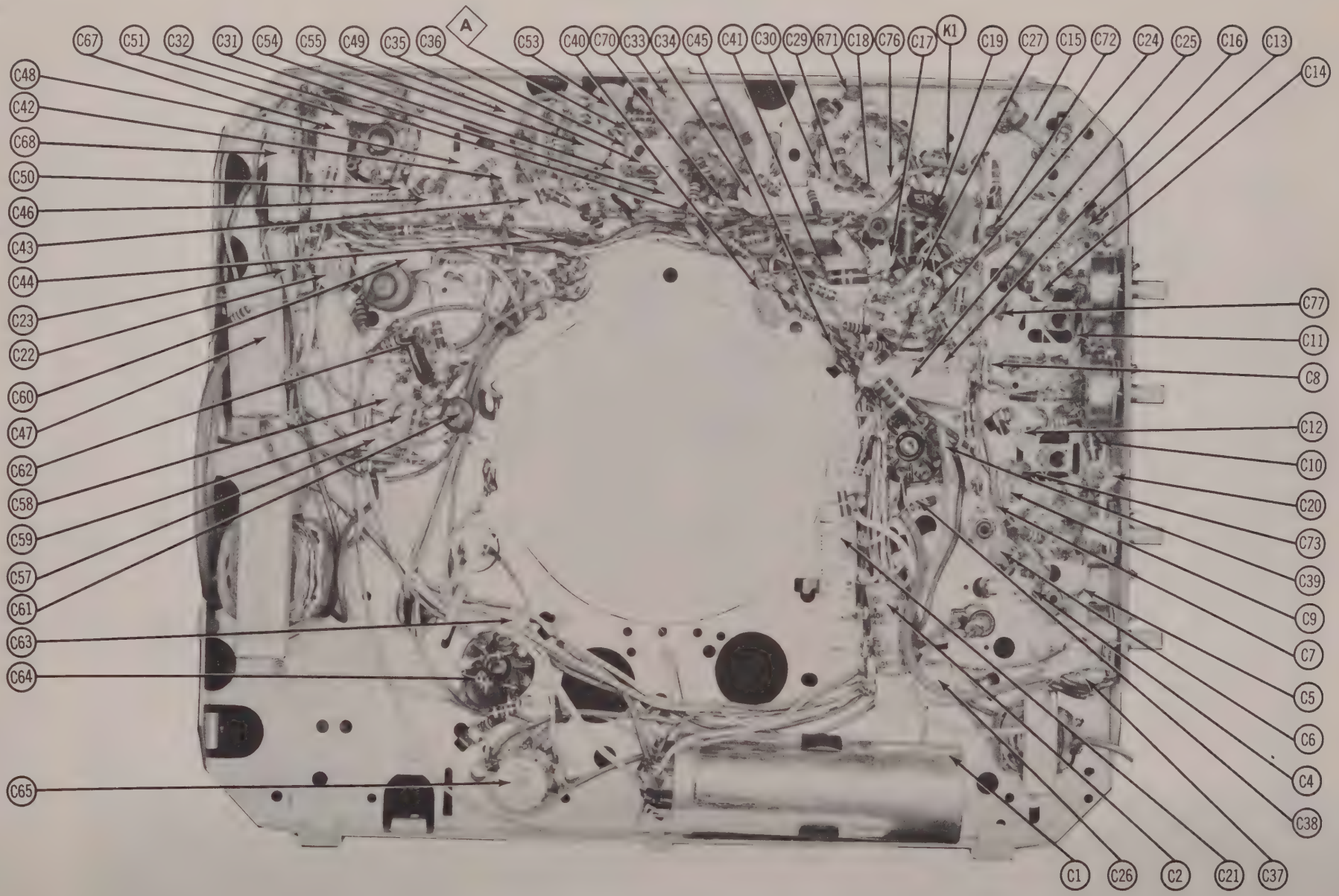
NAME	PART NO	DESCRIPTION
Safety Glass	61K741561	
Bezel	13K742039	Picture Tube
Knob	36K751148	Channel Selector
Knob	36C740837	Fine Tuning
Knob	36K742093	Off-On-Volume
Knob	36B742092	Brightness, Contrast, Vert. Hold
Cabinet	16F742031	
Handle	55D743034	

WIRING DATA

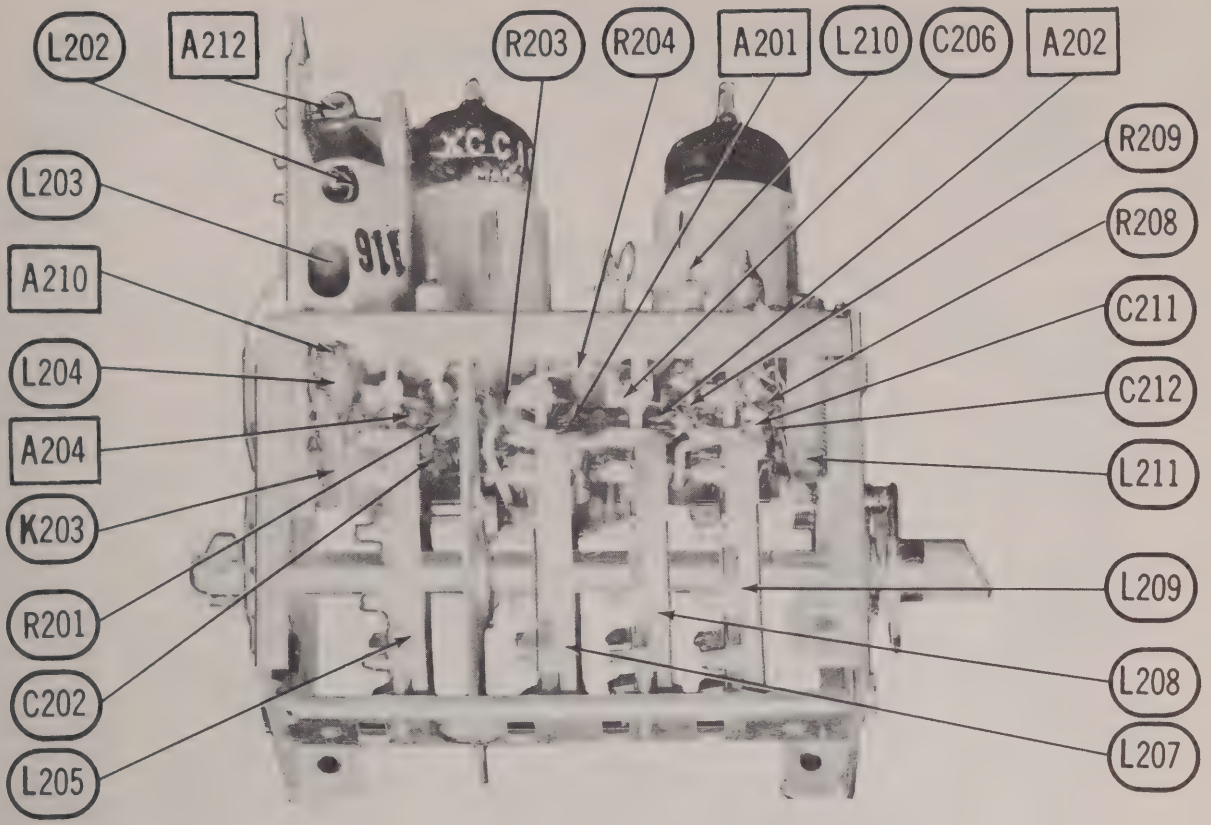
High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-In	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8465 (Round) - 5 Conductor 8468 (Round) - 8 Conductor

MOTOROLA MODEL 14P14-1 (Ch. TS-434)

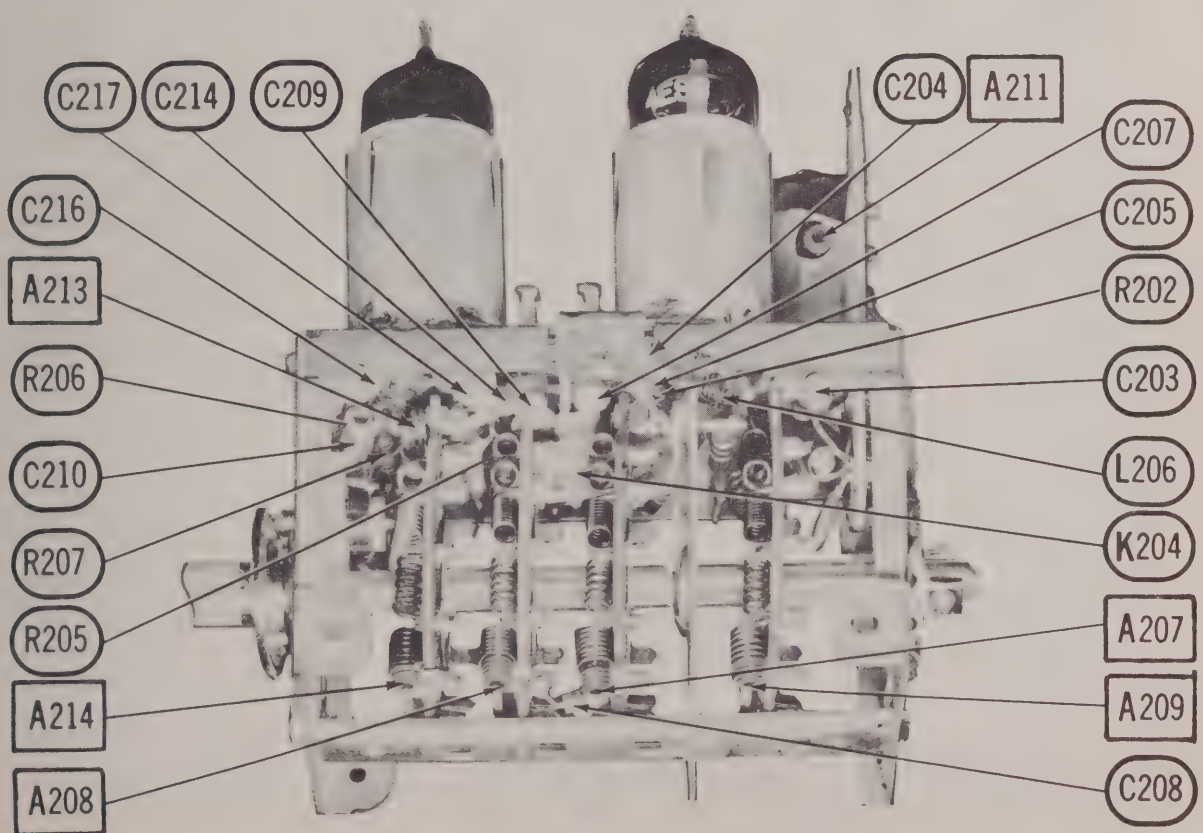
FOLDER 2



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



TUNER - LEFT SIDE



TUNER- RIGHT SIDE

TUNER PARTS LIST AND DESCRIPTIONS

1U751182 (TT-121A)

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp.	XCC189/ 4ES8	

ITEM No.	USE	TYPE	NOTES
V202	Mixer-Osc.	5EU8/ 5FK8	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	1000			21C747758	EF-001	MFT-1000			503C-D1	
C202	3.9		10%	21R128911					5TCCB-V39S 10%*	
C203	2.2		10%	21R115948	NPO-SI 2.2	TCZ-2R2	C10V22C	CNO-522	5TCCB-V22S 10%*	
C204	3.9		10%	21R128911					5TCCB-V39S 10%*	
C205	470			21K748980	BPD-00047	DD-471	L10T47	B-347	5GA-T47	Note 1
C206	1000			21C747758	EF-001	MFT-1000			503C-D1	
C207	2-6			21A747714		829-6		CT-552		
C208	1		10%	21R129567	NPO-SI 1	TCZ-1		CNO-510	5TCCB-V1	
C209	2-6			21A747712		829-6		CT-552		
C210	5.6			21K749376					5TCCB-V56S	
C211	15		5%	21K749582	SI 5	TCZ-15	C10Q15C	CNO-415	5TCC-Q15S 5%*	
C212	3.9		10%	21R128911					5TCCB-V39S 10%*	
C213	1000			21C747758	EF-001	MFT-1000			503C-D1	
C214	470			21K748980	BPD-00047	DD-471	L10T47	B-347	5GA-T47	
C215	1000			21C747758	EF-001	MFT-1000			503C-D1	
C216	470			21K748980	BPD-00047	DD-471	L10T47	B-347	5GA-T47	
C217	470			21K748980	BPD-00047	DD-471	L10T47	B-347	5GA-T47	
C218	1000			21C747758	EF-001	MFT-1000			503C-D1	

Note 1. Tuners coded TT-121B, TT121C use 2200mmf in this application. (Part #21K752444)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		MOTOROLA PART No.	NOTES
	OHMS	WATT		
R201	47K		6K121687	
R202	470K		6K129148	
R203	470K		6K129148	
R204	470Ω		6K127633	
R205	100K		6K128593	

ITEM No.	RATING		MOTOROLA PART No.	NOTES
	OHMS	WATT		
R206	15K		6K128592	
R207	33K		6K127807	
R208	2200Ω		6K128689	
R209	47K		6K129214	

COILS (RF-IF)

ITEM No.	USE	MOTOROLA PART No.	NOTES
L201	IF Trap Coil	24K749367 †	† Part of M201.
L202	IF Trap Coil	24K749367 †	
L203	Ant. Trans.	24B749398 †	
L204	FM Trap Coil	24K749366 †	
L205	Ant. Coils	1V751178	Channel 2-13. Includes Wafer Assy.
L206	RF Choke	24K751377	
L207	RF Coils	1V751179	Channels 2-13. Includes Wafer Assy.

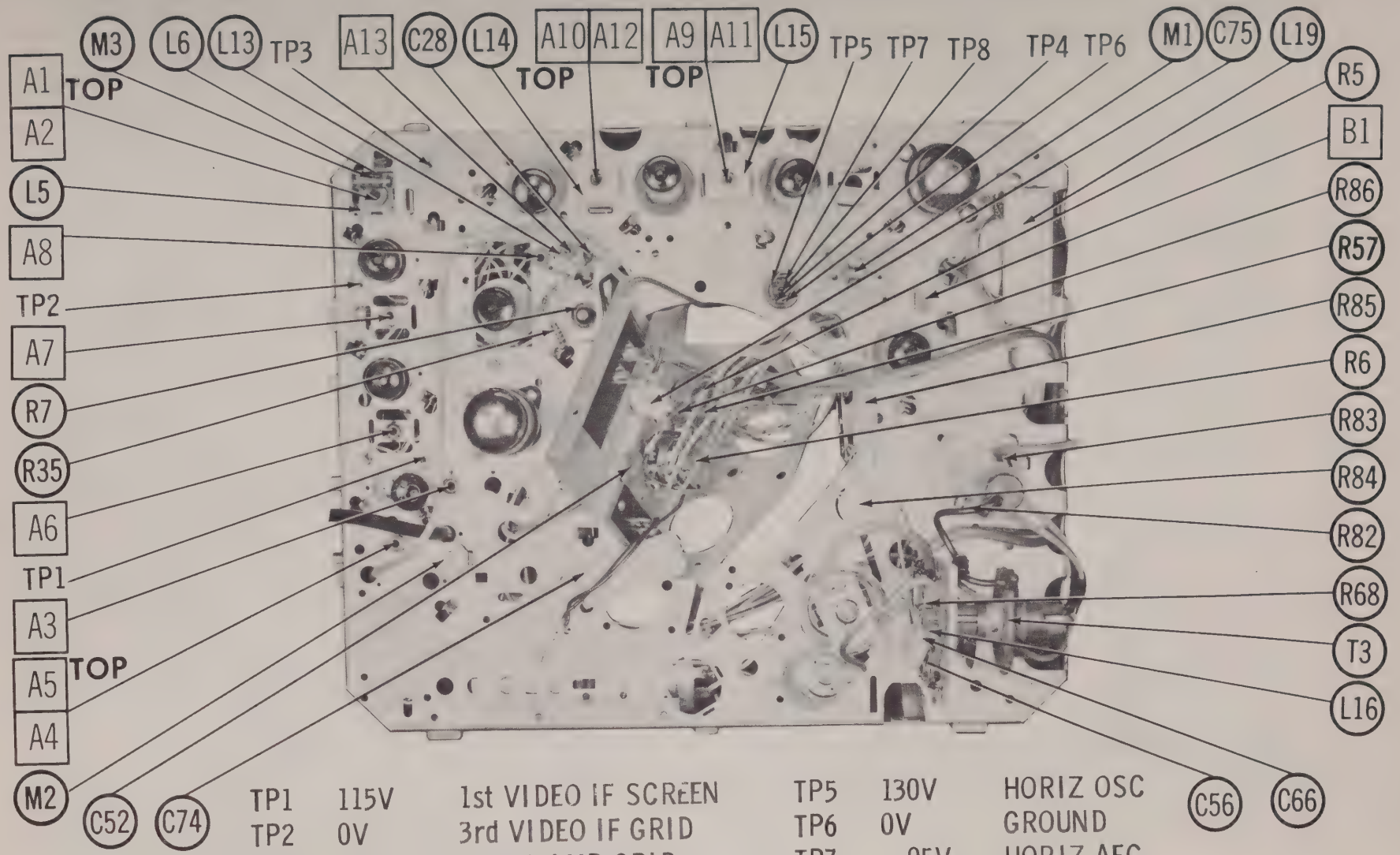
ITEM No.	USE	MOTOROLA PART No.	NOTES
L208	Mixer Grid Coils	1V751378	Channels 2-13. Includes Wafer Assy.
L209	Osc. Coils	1V748991	Channels 2-13. Includes Wafer Assy.
L210	RF Choke	24K743675	
L211	Mixer Plate Trans.	24B747838	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	MOTOROLA PART No.	REPLACEMENT DATA
K201	Antenna Isolation & Filter	10mmf, 22mmf, 470K	51C747535	
K202	Antenna Isolation & Filter	10mmf, 22mmf, 470K	51C747535	
K203	Antenna Coupling	4.7mmf, 15mmf, 27mmf	51C747536	
K204	RF Coupling	15mmf, 47mmf, 105mmf	51C747700	

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M201	Hi-Pass Filter Assy.	1V748995	Includes C203, K201, K202, K203, L201, L202, L203



TP1	115V	1st VIDEO IF SCREEN	TP5	130V	HORIZ OSC
TP2	0V	3rd VIDEO IF GRID	TP6	0V	GROUND
TP3	-2.8V	VIDEO AMP GRID	TP7	-.05V	HORIZ AFC
TP4	-.55V	AGC	TP8	135V	B+

CHASSIS TOP VIEW

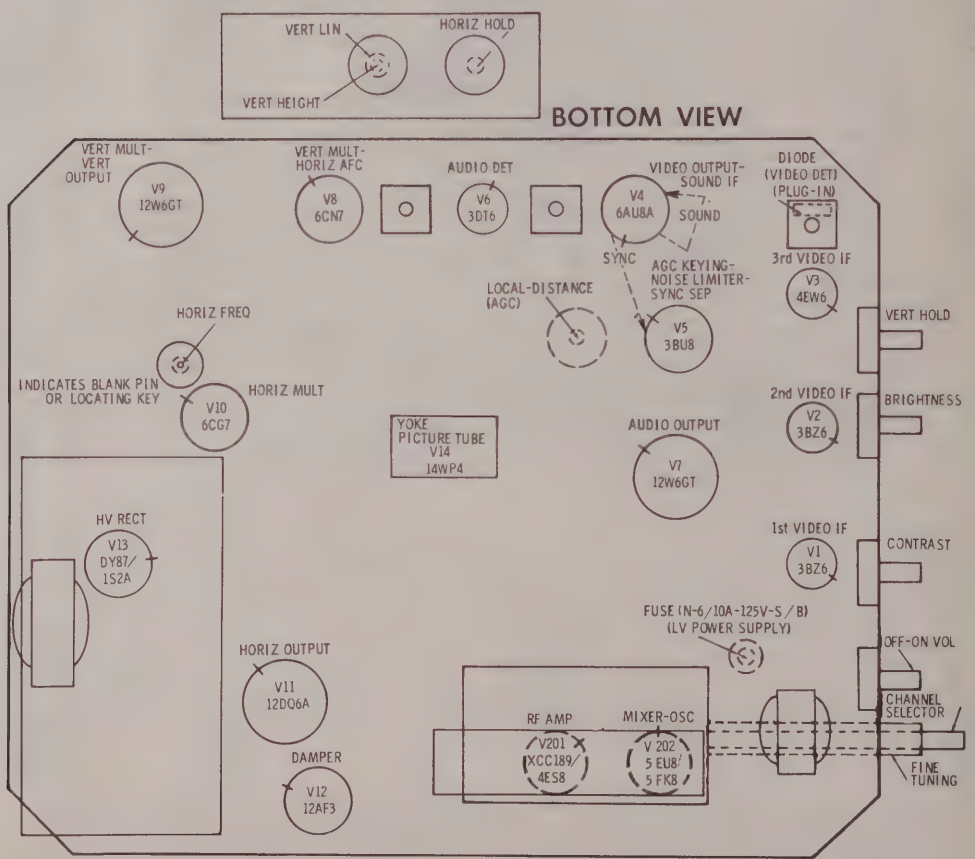
MOTOROLA MODEL
14P14-1 (Ch. TS-434)

FOLDER 2

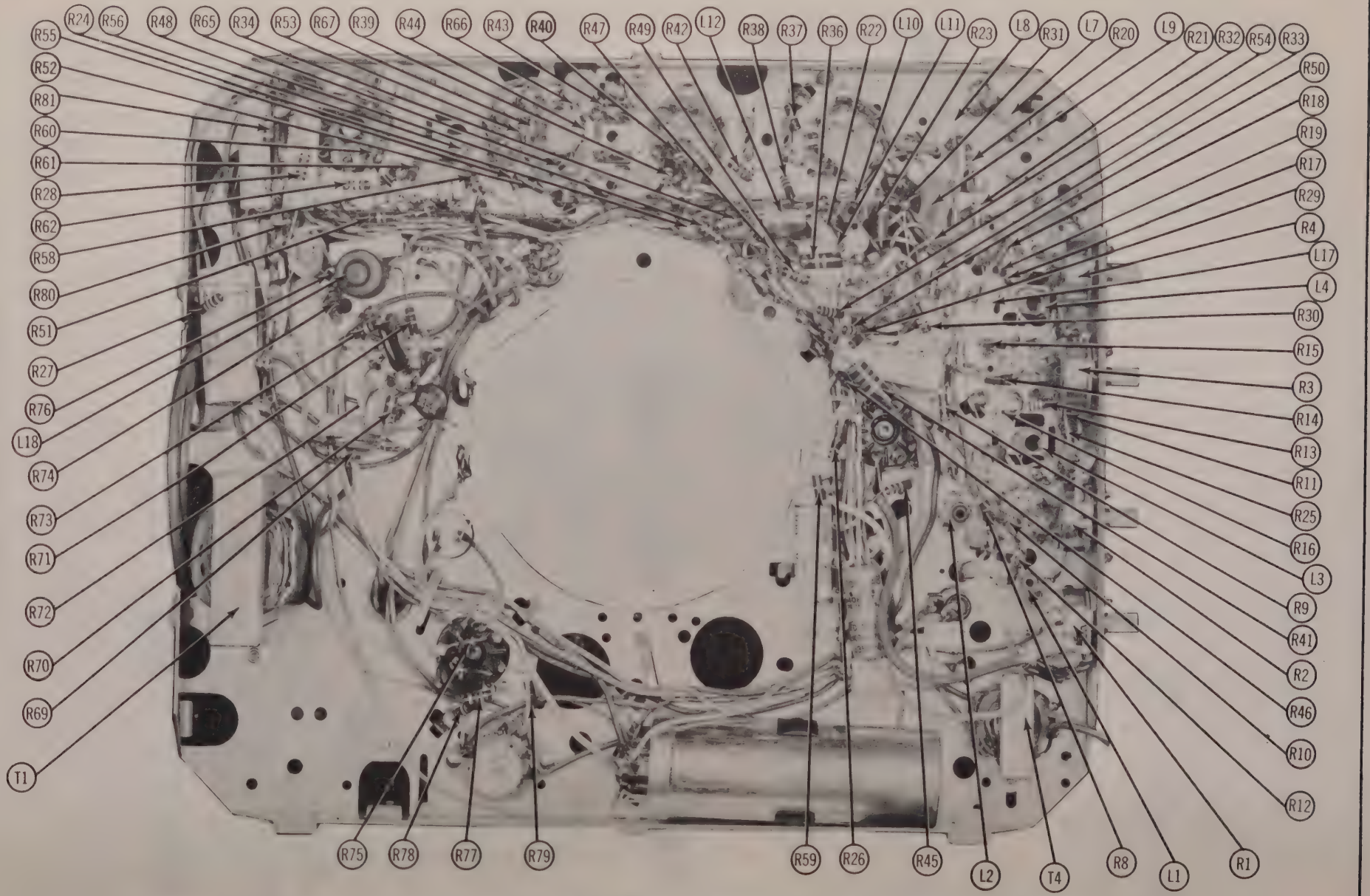
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9	
V1	3BZ6	1.7meg	47Ω	12.5Ω	12Ω	†1500Ω	†1500Ω	0Ω			
V2	3BZ6	1.7meg	47Ω	12Ω	11.5Ω	†1500Ω	†1500Ω	0Ω			
V3	4EW6	.1Ω	120Ω	11.5Ω	10.5Ω	†220Ω	†220Ω	0Ω			
V4	6AU8A	0Ω	100K	†27K	9.5Ω	10.5Ω	0Ω	72K	†3900Ω	†4200Ω	
V5	3BU8	10K	†0Ω	1meg	3Ω	2.5Ω	● 70K	†1meg	†47K	†12meg	
V6	3DT6	3.6Ω	560Ω	3Ω	3.5Ω	‡690K	†3300Ω	560K			
V7	12W6GT	NC	12.5Ω	†935Ω	†680Ω	47K	TP	14Ω	180Ω		
V8	6CN7	22K	200K	100K	3.5Ω	3.5Ω	0Ω	● 2.2meg	●2.5meg	4.5Ω	
V9	12W6GT	NC	6Ω	†235Ω	†0Ω	2.7meg	NC	8.5Ω	0Ω		
V10	6CG7	†68K	●100K	820Ω	4.5Ω	6Ω	†5600Ω	5meg	820Ω	NC	
V11	12DQ6A	TP	19Ω	TP	†100Ω	450K	TP	16Ω	0Ω	TOP CAP ‡250Ω	
V12	12AF3	NC	†0Ω	TP	16Ω	14Ω	NC	NC	NC	†0Ω	TOP CAP ¶400K
V13	DY87/ 1S2A	PINS 1 THRU 9 HAVE INFINITE RESISTANCE									TOP CAP ‡250Ω
V14	14WP4	8.5Ω	47K	Pin 6 ‡200K	Pin 10 ‡200K	Pin 11 ● 130K	Pin 12 9.5Ω				
V201	XCC189 /4ES8	†470Ω	250K	INF	0Ω	1Ω	INF	1.4meg	0Ω	0Ω	
V202	5EU8/ 5FK8	†1Ω	15K	†2200Ω	1Ω	2.5Ω	†0Ω	100K	0Ω	†47K	
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 135V SOURCE. NC NO CONNECTION.
‡ MEASURED FROM TOP CAP OF V12. TP TIE POINT.



TUBE PLACEMENT CHART

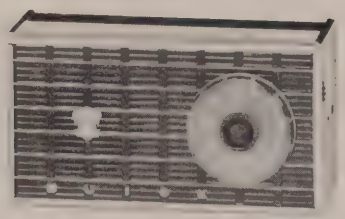


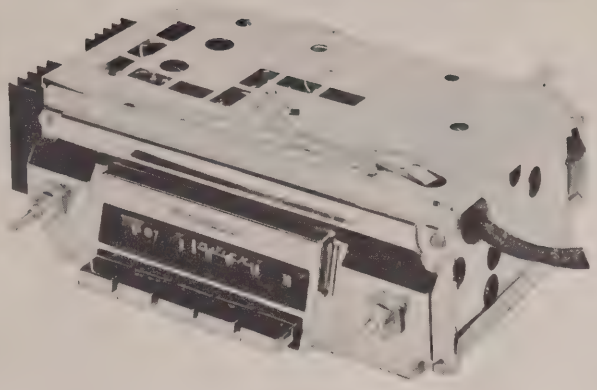
CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PHOTOFACT* Folder with CIRCUITRACE*

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

BUICK MODEL 981970





BUICK MODEL 981970

TRADE NAME	Buick Model 981970 (For 1959 Buick Automobiles)
MANUFACTURER	Delco Radio Div., G. M. Corp., Kokomo, Indiana
TYPE SET	Battery Operated Custom Built Transistorized Automobile Receiver With Portable Unit
POWER SUPPLY	12 Volt Storage Battery (Automobile) 6 Volts DC (Portable)
RATING	1 Amp. @ 12.6 Volts DC (Automobile) 5.8MA @ 6 Volts DC (No Signal, Min. Volume) Portable 8MA @ 6 Volts DC (Signal, Normal Volume) Portable
TUNING RANGE	540 —1680KC (Portable) 540 —1625KC (Automobile)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:

A1, A2, A3, A4, A7..... GENERAL CEMENT #8282, 8606, 8606L, 9091
WALSCO #2526, 2541, 2543, 2544

A5, A6, A9, A10, A11..... GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537

A8, A12, A13..... GENERAL CEMENT #8607, 9291
WALSCO #2520, 2522, 2523, 2524, 2537

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to base of converter (X2). Low side to chassis.	465KC (400∿ Mod.)	High frequency stop	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	1680KC	"	"	A5, A6	"
3.		Not Used		Near 600KC	"	A7	Adjust for maximum background noise.
4.		Loop	1400KC	1400KC Signal	"	A6	Adjust for maximum output.
	Install portable unit in automobile portion of receiver for the following steps. Check setting of oscillator coil (A8). Rear of core should be 1 5/8" from mounting end of coil form.						
5.	82mmf	High side to antenna receptacle. Low side to chassis.	1615KC	High frequency stop	Across voice coil	A9, A10, A11	Adjust for maximum output. action.
6.	"	"	600KC	600KC Signal	"	A12, A13,	Adjust for maximum output.
7.	"	"	1615KC	1615KC Signal	"	A10, A11	"
	With receiver tuned to a 1000KC signal adjust pointer adjustment so that pointer coincides with 1000KC mark on dial.						

PUSHBUTTON ADJUSTMENT

1. Pull button to left and out.
2. Tune manually to desired station.
3. Press button in firmly.
4. Repeat for remaining buttons.

DISASSEMBLY

1. Remove portable unit from automobile.
2. Remove metal screw from each end of cabinet. Remove end panels.
3. Unscrew and remove tuning dial center screw. Remove dial cover.
4. Rotate dial for access to set screw holding pointer. Loosen screw and remove pointer.
5. Spread cabinet sides and remove top cover.
6. Spread cabinet sides and lift out printed board. For complete removal, unsolder lead from antenna.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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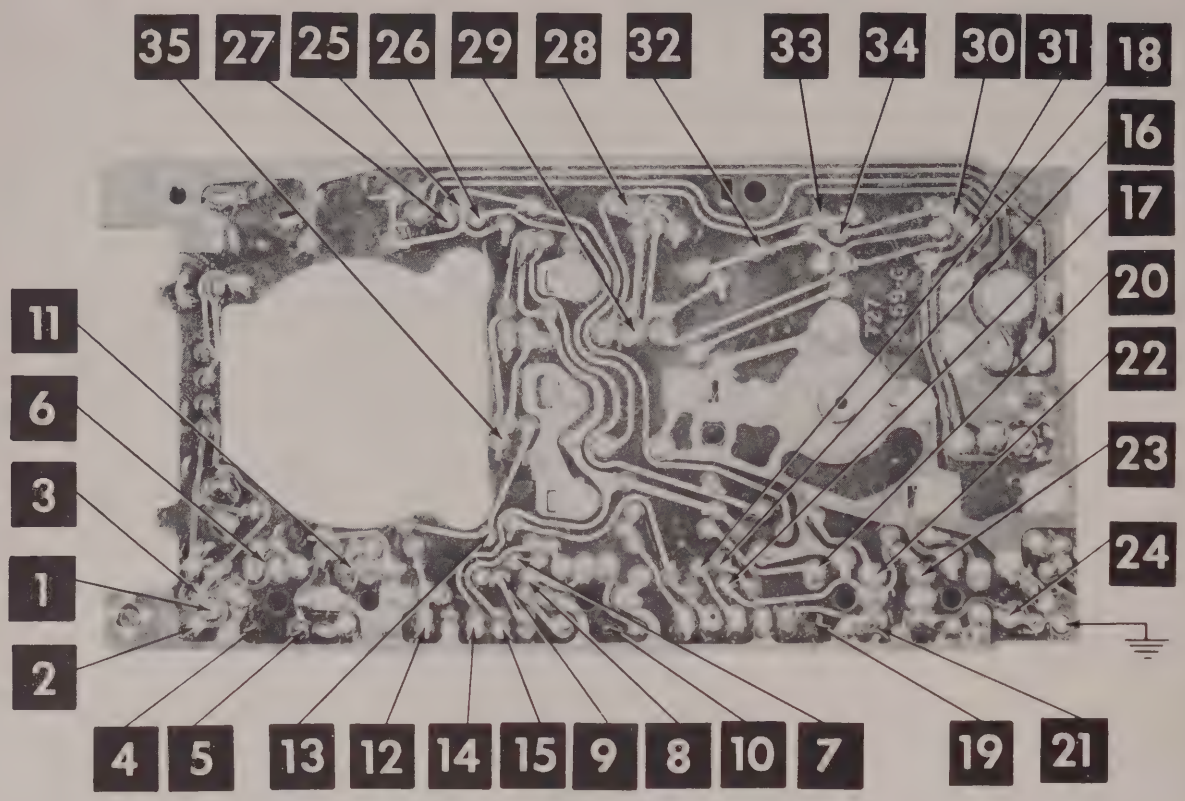
SET 455 FOLDER 3

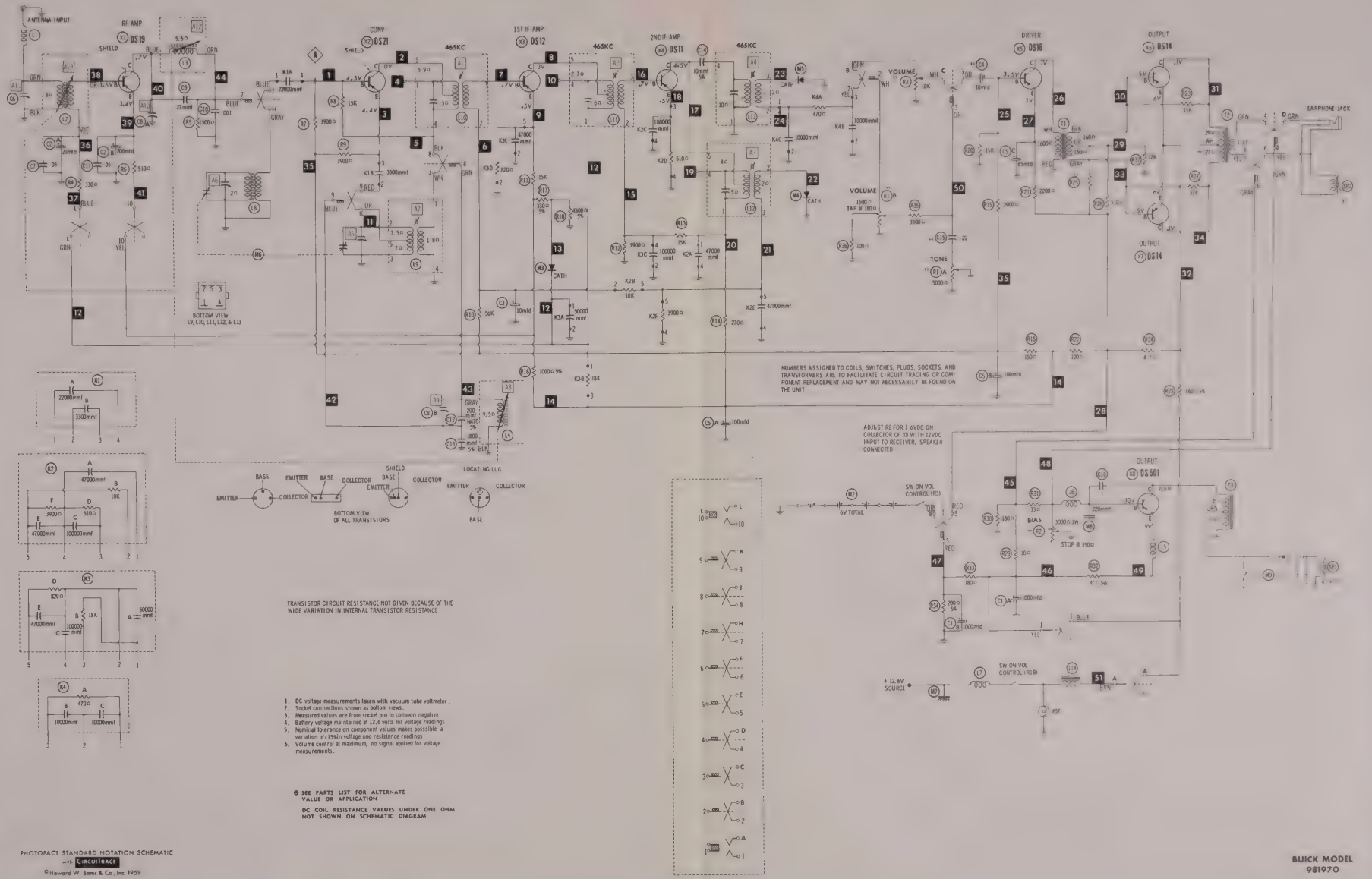


A Howard W. Sams CIRCUITRACE* Photo

PORTABLE UNIT — PRINTED BOARD

A Howard W. Sams CIRCUITRACE* Photo

AUTO UNIT — PRINTED BOARD


ANTENNA INPUT
RF AMP
X1 DS19
CONV
X2 DS21
1ST IF AMP
X3 DS12
2NDIF AMP
X4 DS11
465KC
DRIVER
X5 DS16
OUTPUT
X6 DS14
X7 DS14
X8 DS501
VOLUME
TONE
BIAS
STOP @ 350Ω
EARPHONE JACK
6V TOTAL
+12.6V SOURCE
SW ON VOL CONTROL (R3)
SW ON VOL CONTROL (R1B)
BOTTOM VIEW L9, L10, L11, L12, & L13
BOTTOM VIEW OF ALL TRANSISTORS
LOCATING LUG
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT
ADJUST R2 FOR 1 6VDC ON COLLECTOR OF X8 WITH 12VDC INPUT TO RECEIVER, SPEAKER CONNECTED
TRANSISTOR CIRCUIT RESISTANCE NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE
1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative
4. Battery voltage maintained at 12.6 volts for voltage readings
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements.
⊛ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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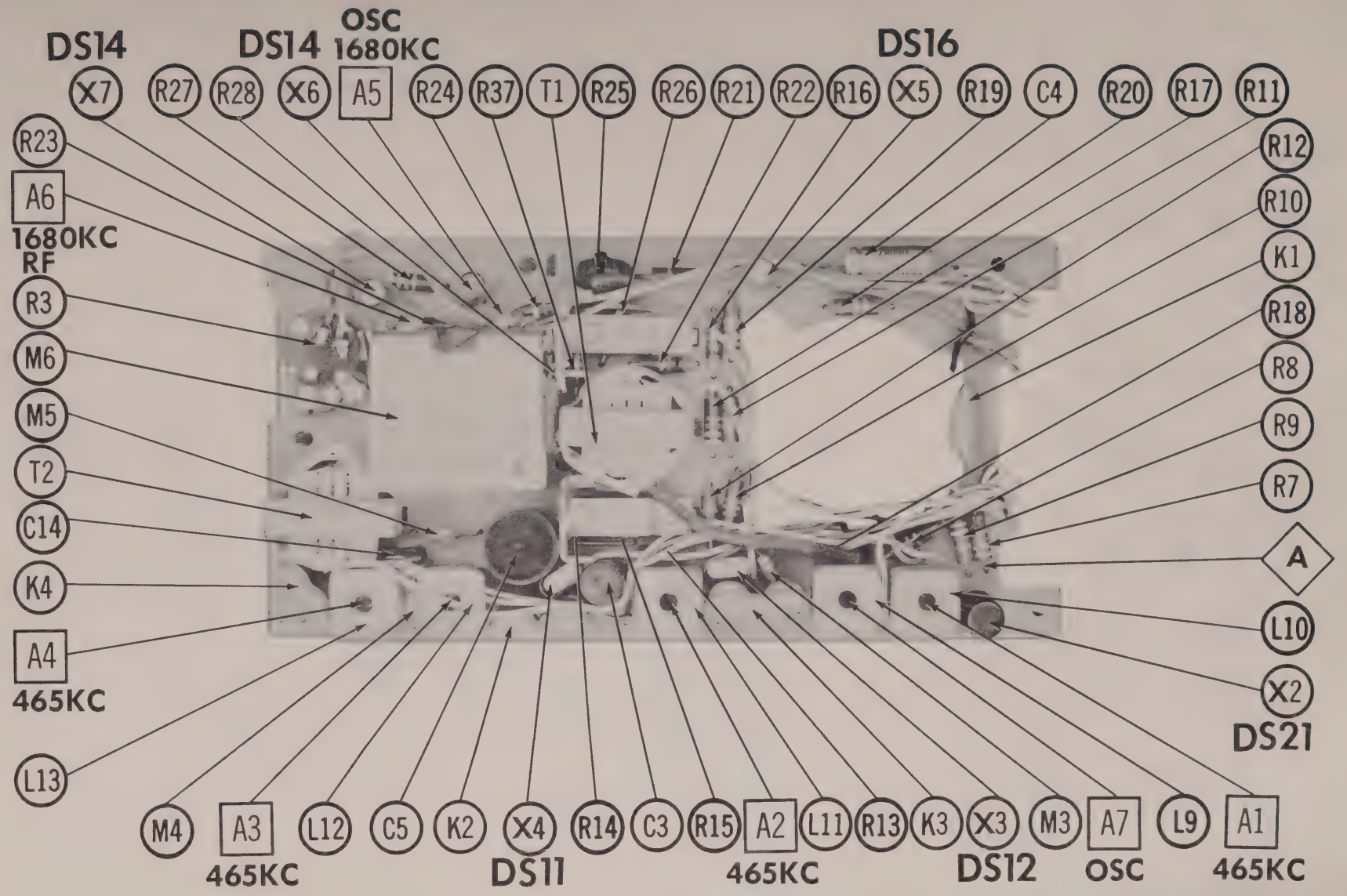
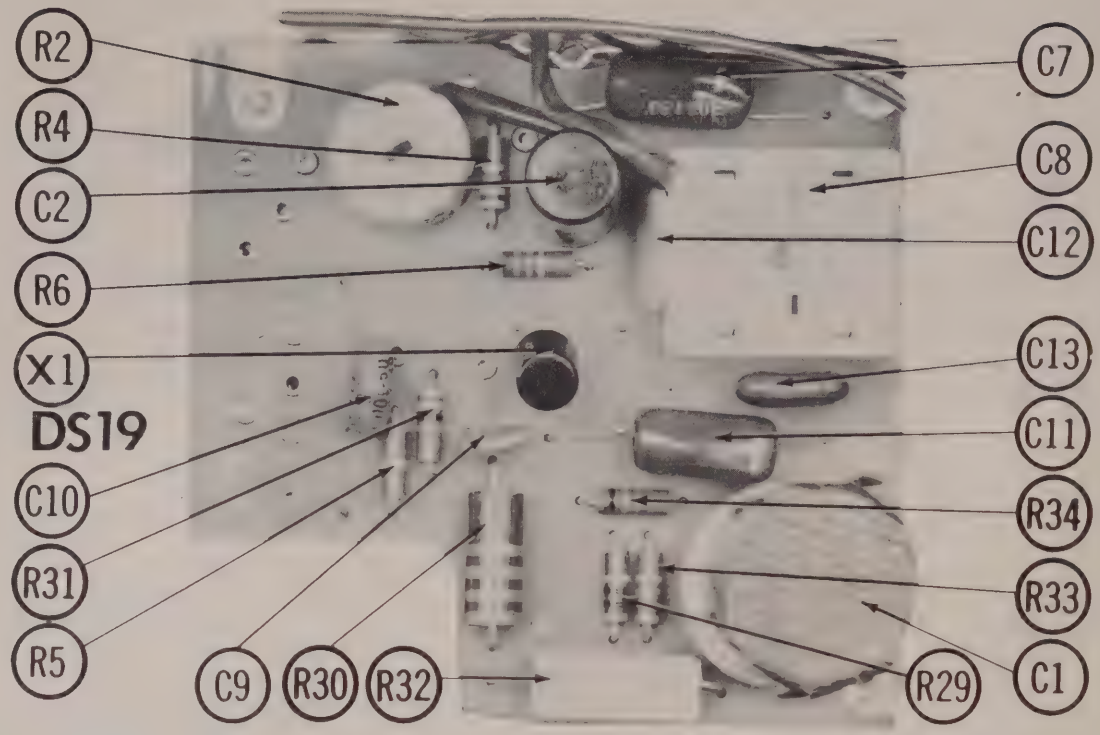
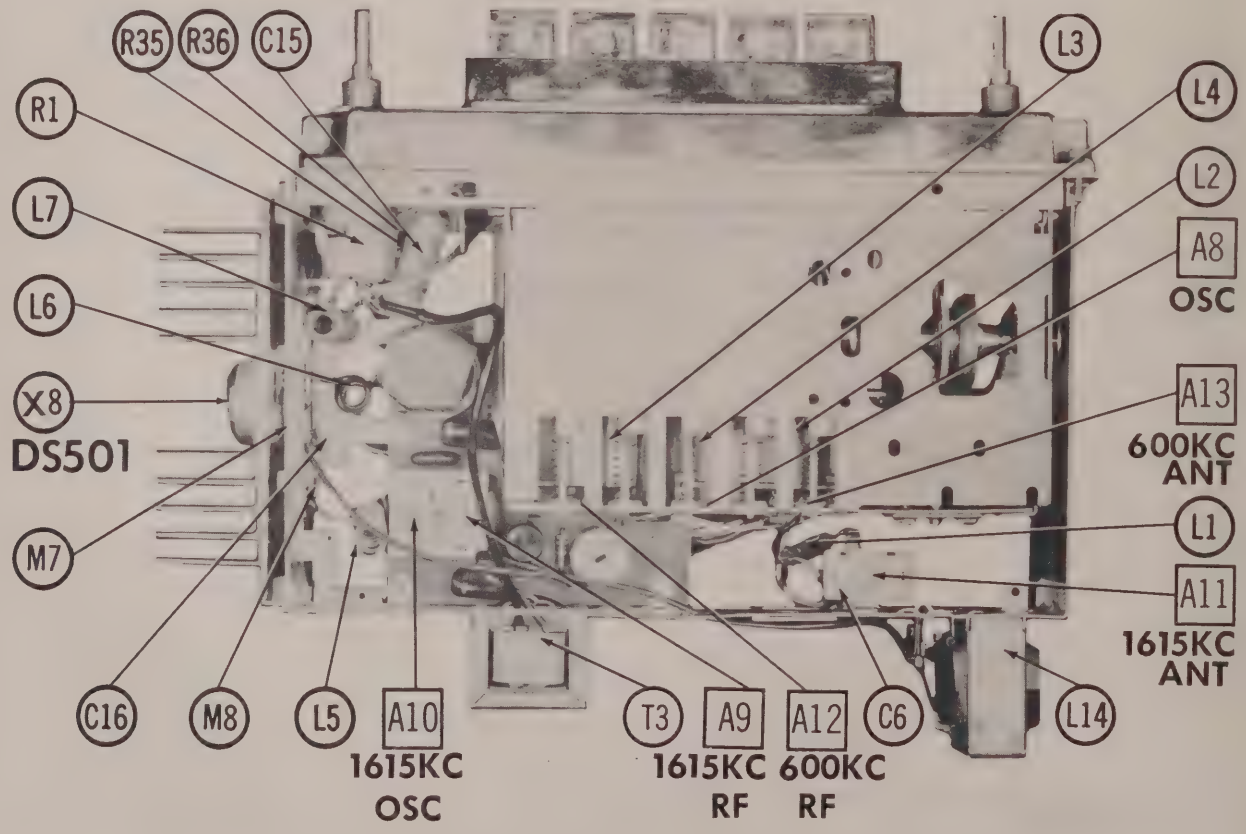
BUICK MODEL 981970



PORTABLE UNIT - PRINTED BOARD



AUTO UNIT - PRINTED BOARD



AUTO UNIT — TOP VIEW

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	DS-19	RF Amplifier (Auto)					PNP
X2	DS-21	Converter		2N642			PNP
X3	DS-12	1st IF Amplifier					NPN
X4	DS-11	2nd IF Amplifier					NPN
X5	DS-16	Driver		2N591			PNP
X6	DS-14	Output (Portable)		2N408			PNP Matched Pair
X7	DS-14	Output (Portable)		2N408			PNP
X8	DS-501	Output (Auto)					PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	DELCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	■1000	16	7273793	PWH2-75-45				PCLS-2162*	
B	▲1000	10							
C2A	20	8	7273794	PR2-020				VLS-2195 *	
B	200	8							
C3	10	8	7273798	PWE10010	ECPB408	PET1760	ML10-15	VL-1127	
C4	10	8	7271255 ①	PWE10010	NLW10-10	TT12X10	ML10-15	TE-1114	
C5A	100	8	7274108	PR3-005		PET3400		VL-3320	
B	100	8							
C	65	8							

① Alt. Part #7273799

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	DELCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C6				7273960						
C7	.05	50		7271670	P285N-05	DF-503	STM1S47	GTM1147	2TM-S5	
C8A				7273797						
B										
C9	27			7271876	DI-27	DD-270	L10Q27	CNO-427	5GA-Q27	
C10	.001	50		7273792	P285N-001	DD-102	STM1D1	GTM121	6TM-D1	
C11	.05	50		7271670	P285N-05	DF-503	STM1S47	GTM1147		
C12	200		N470 5%	7271299						
C13	1800		5%	7273795	1464-0018		1R5D18		MS-218	
C14	10		5%	7270977	1469-00001	DTN-10	22R5Q1	MCE220	MS-410	
C15	.22	100			P288N-22		WMF1P22E	GTM1022	2TM-P22	①
C16	.1	100		7271042	P285N-1	DF-104	STM1P1	GTM101	2TM-P1	

① Some versions may use .47mfd in this application (Part #7257906).

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	DELCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	5000Ω	½	7273848①				■ UE3998-S	Tone
B	1500Ω	½						Volume, Tap @ 180Ω
C	Switch							Power Off-On
R2	3000Ω	1 (ww)	②					Bias, Stop @ 350Ω
R3A	10K	1/4	7274634③					Volume
B	Switch							Power Off-On

① Auto Unit
② Some versions may use 1000Ω 1W in this application (Part #7273796).
③ Portable unit
■ "STA-LOC" equivalent: FF53L, RU152T181, CS1375, IS2062, US41.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		DELCO PART No.	NOTES
	OHMS	WATT		
R4	330Ω		1119	
R5	1500Ω		1127	
R6	510Ω		1213228	
R7	3900Ω		1132	
R8	15K		1213	
R9	3900Ω		1132	
R10	56K		1220	
R11	15K		1213	
R12	3900Ω		1132	
R13	15K		1213	
R14	270Ω		1118	
R15	150Ω		1115	
R16	1000Ω 5%		1220176	
R17	330Ω 5%		7269768	
R18	4300Ω 5%		7273757	
R19	3900Ω		1132	
R20	15K		1213	
R21	2200Ω		1129	
R22	100Ω		1113	
R23	33K		1217	
R24	4.7Ω		7269775	
R25			7270782	Note 1
R26	510Ω		1213228	
R27	33K		1217	
R28	360Ω 5%		1213225	
R29	10Ω		1101	
R30	180Ω	2	1190	
R31	33Ω		1107	
R32	.47Ω	5	7270608	Fuse Type
R33	180Ω		1116	
R34	200Ω 5%		7273790	
R35	3300Ω		1131	
R36	100Ω		1113	
R37	12K		1212	

Note 1. Temperature compensating unit.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		DELCO PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Ant. Coil (Car)	7255738	19-1004	19-1004	BC-565	4610		
L2	Ant. Tuning Coil (Car)	1221338						
L3	RF Coil (Car)	1221338						
L4	Osc. Coil (Car)	1221139						
L5	RF Choke	1217846						1.4uh
L6	RF Choke	1217846						1.4uh
L7	"A" Lead Choke	1217846						1.4uh
L8	Loopstick (Portable)	7274005						
L9	Osc. Coil (Portable)	7273763						
L10	1st IF Trans.	7274341						
L11	2nd IF Trans.	7273760						
L12	3rd IF Pri.	7273761						
L13	3rd IF Sec.	7273762						

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ∿)	DELCO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L14	.9A	.7Ω	.011 HY	7273850				TC-2		

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	DELCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.3	1	7273764					TY-56X①	① Use original channel frame

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA: DELCO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	150Ω CT	10Ω	7273765				TA-40①		TY-58X①	① Use original channel frame
T3	9Ω	Tap ⓐ 3-4Ω	7273626				TA-50①			

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: DELCO PART No.	QUAM PART No.	NOTES
SP1	4"x 10"	PM	3-4Ω	7273342	46A15	
SP2	3"	PM	12-13Ω	7273929		

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	DELCO PART No.	REPLACEMENT DATA
K1	Converter Couplate	22000mmf, 3300mmf	7273803	Sprague SIS-5
K2	IF Network Couplate	47000mmf, 47000mmf, 100000mmf, 510Ω, 3900Ω, 10K	7273801	Sprague SIS-6
K3	AVC Couplate	47000mmf, 50000mmf, 100000mmf, 820Ω, 18K	7273802	Sprague ACGS-2
K4	Diode RF Filter	10000mmf, 10000mmf, 470Ω	7273804	Sprague DS-6

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA: DELCO PART No. FUSE	DELCO PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1			4A 32V					

BATTERIES

ITEM No.	VOLTAGE	DELCO PART No.	REPLACEMENT DATA: BURGESS "A"	BURGESS "B"	EVEREADY "A"	EVEREADY "B"	MALLORY "A"	MALLORY "B"	NOTES
M2	6V		Z ①		E9N ①		DM-9N①		① 4 Required

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: DELCO PART No.	CBS PART No.	SYLVANIA PART No.	NOTES
M3		DS18	1N60	1N60	AVC
M4		DS18	1N60	1N60	Overload
M5		DS18	1N60	1N60	Overload

MISCELLANEOUS

ITEM No.	PART NAME	DELCO PART No.	NOTES
M6	Tuning Capacitor	7273835	Two Gang
M7	Spark Plate	1221054	
M8A	Spark Plate	7270361	220mmf
B	Spark Plate		220mmf
M9	Switch	7271424	Speaker Interlock
	Printed Board	7273516D	(Auto)
	Printed Board	7273459G	(Portable)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	7273881	Tuning
Knob	7273822	Volume-On-Off (Portable)
Knob	1186745	Control
Knob	1186766	Dummy
Knob	1186767	Tone
Pushbutton	1221280	Includes Front Plate and Slides
Pushbutton	7272805	#1
Pushbutton	7272806	#2
Pushbutton	7272807	#3
Pushbutton	7272808	#4
Pushbutton	7272809	#5
Cover	7273542	Antenna (Portable)
Pointer	7272734	
Pointer # Hub Ass'y	7273874	(Portable)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire ..... Use BELDEN No. 8885
Bonding Strap ..... Use BELDEN No. 8661

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

COLUMBIA
MODELS 634, 680

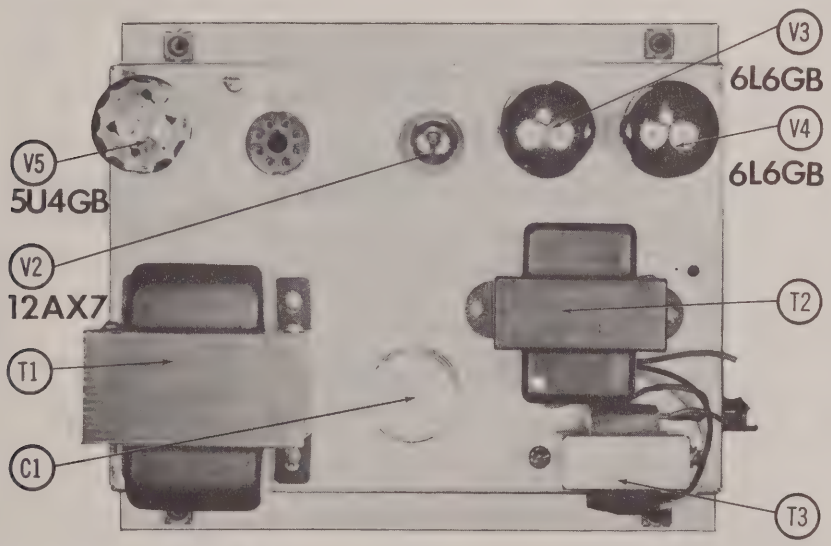
COLUMBIA
MODELS 634, 680

MODEL 634

COLUMBIA
MODELS 634, 680

TRADE NAME	Columbia Records Models 634, 680
MANUFACTURER	Columbia Records, Inc., 799 Seventh Ave., New York 19, N. Y.
TYPE SET	AC Operated 5 Tube Stereo Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 124 Watts, 1.15 Amp. @ 117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER — SEE V-M 1200A — PHOTOFACT SET 353 FOLDER 16
OR RECORD CHANGER MANUAL RC-10



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JT184

SET 455 FOLDER 4

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Left Channel AF Amp. - Right Channel AF Amp.	12AX7	
V2	Left Channel AF Amp. - Right Channel AF Amp.	12AX7	
V3	Left Channel Output	6L6GB	
V4	Right Channel Output	6L6GB	
V5	Rectifier	5U4GB	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	Columbia PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	▲40	450	11B725	AFH4-18-30	D0174	FP447	TMQ-123	TVL-4773	
B	20	450							
C	▲20	450							
D	■20	450							
C2	25	50	11B731	SRE50V25	BBR25-50	TC-36	TD-25-50	TVA-1306	
C3	25	50	11B731	SRE50V25	BBR25-50	TC-36	TD-25-50	TVA-1306	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	Columbia PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C4	2000				BPD-002	DD-202	BYA10D2	B-220	5HK-D2	
C5	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C6	5000				BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C7	470				BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C8	4000				BPD-004	DD-402	BYA10D4	B-240	5HK-D4	
C9	180				BPD-00018	DD-181	L10T18	B-318	5GA-T18	
C10	4000				BPD-004	DD-402	BYA10D4	B-240	5HK-D5	
C11	.1	600			P688N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C12	2000				BPD-002	DD-202	BYA10D2	B-220	5HK-D2	
C13	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C14	5000				BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C15	470				BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C16	4000				BPD-004	DD-402	BYA10D4	B-240	5HK-D4	
C17	180				BPD-00018	DD-181	L10T18	B-318	5GA-T18	
C18	4000				BPD-004	DD-402	BYA10D4	B-240	5HK-D4	
C19	.1	600			P688N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C20	20000				BPD-02	DD-203	BYB6S2	B-120	5HK-S2	
C21	20000				BPD-02	DD-203	BYB6S2	B-120	5HK-S2	
C22	.05	400			P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C23	1.5	200					WMF2W1P5E	GTM11P5		

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Columbia PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2meg	½	9B588	B-76		Q13-139	† UE1873-S	Loudness, Ch. B.
B	2meg	½		SR-76		M13-139		Loudness, Ch. A.
C	Switch			KR-1		76-1		Power On-Off
R2A	2meg	½	9B587	B-76		Q13-139	‡ UE1877	Treble, Ch. B
B	2meg	½		SR-76		M13-139		Treble, Ch. A
R3A	2meg	½	9B587	B-76		Q13-139	‡ UE1877	Bass, Ch. B
B	2meg	½		SR-76		M13-139		Bass, Ch. A
R4	100K	½	9B586	BT-39				Balance

† "STA-LOC" equivalent: FA26A, RU26A, CS3500, US41
‡ "STA-LOC" equivalent: FA26A, RU26A, CS3500

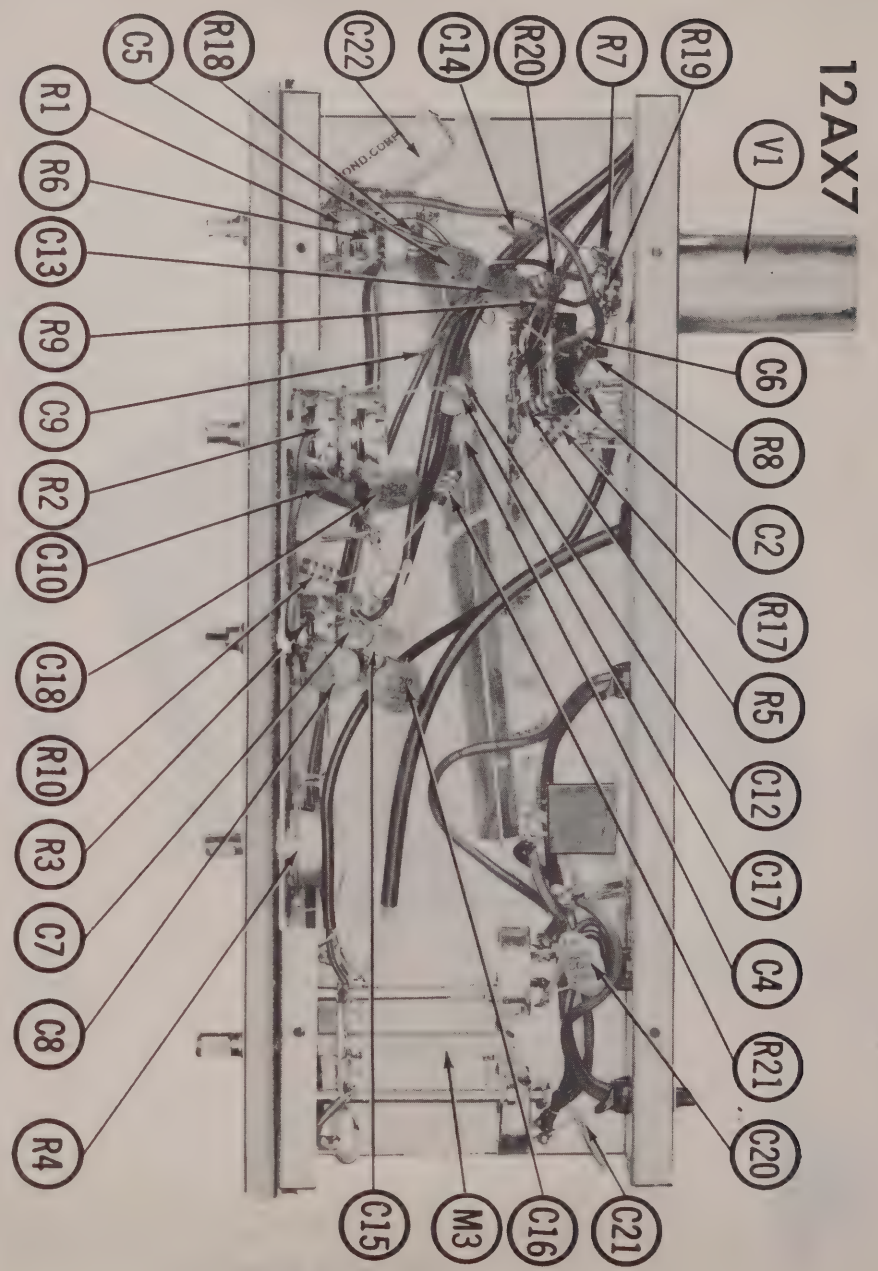
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		Columbia PART No.	NOTES
	OHMS	WATT		
R5	180K			
R6	100K			
R7	10meg			

ITEM No.	RATING		Columbia PART No.	NOTES
	OHMS	WATT		
R8	270K			
R9	27K			
R10	470K			

PRE-AMP CHASSIS BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	Columbia PART No.	NOTES
R11	6.8meg			
R12	100K 5%			
R13	100Ω			
R14	2700Ω			
R15	470K			
R16	120Ω	5	16B421	
R17	180K			
R18	100K			
R19	10meg			
R20	270K			

ITEM No.	RATING OHMS	RATING WATT	Columbia PART No.	NOTES
R21	470K			
R22	6.8meg			
R23	100K			
R24	100Ω			
R25	470K			
R26	2700Ω			
R27	1500Ω	2		Note 1
R28	250Ω	10	16B422	
R29	250Ω	10	16B422	
R30	15K			

Note 1. Some versions may use 1200Ω 1W in this application.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	Columbia PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V@ 1.15A	740 VCT @.160A	5V@ 3A	2B108						
	SEC. 3	SEC. 4	SEC. 5							
	6.3V@ 2.9A									

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	Columbia PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	4000Ω CT	3-4Ω CT	3B227							
T3	1500Ω	1-2Ω	3B228							

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	Columbia PART No.	QUAM PART No.	NOTES
SP1	12"	PM	9-10Ω	1B136 ①	12A6A	① Models 634 & 680
SP2	4"	PM	3-4Ω	1B125 ②	3A07	② Model 634
SP3	4"	PM	3-4Ω	1B125 ②	3A07	③ Model 680, 3 Used
SP4	4"	PM	3-4Ω	1B125 ②	3A07	
	3½"	PM		1B112 ③		

PHONO CARTRIDGE

ITEM No.	Columbia PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	REMARKS
M1	SC-1	13-TB *				* Includes needle & Mounting Mechanism

PHONO NEEDLE

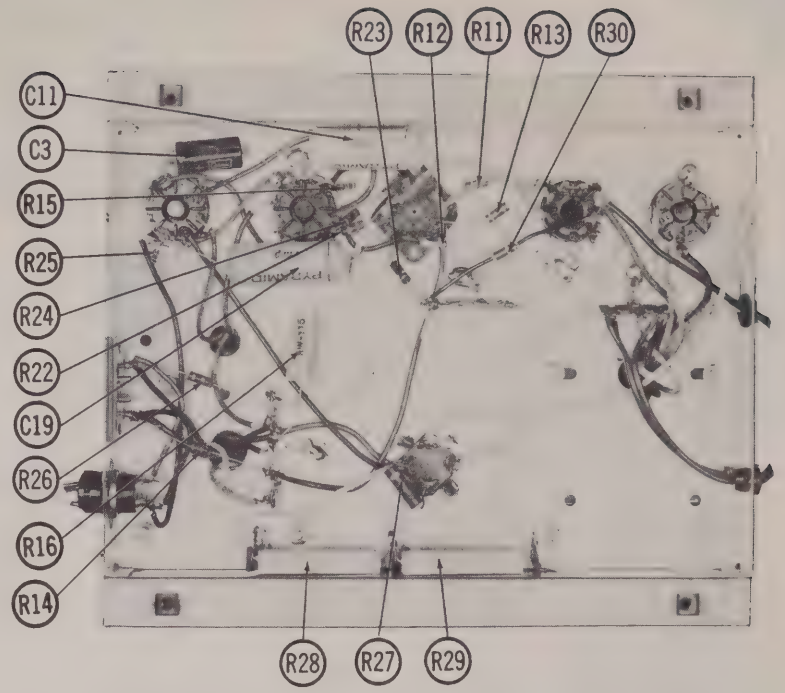
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	Columbia PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M2		CS-1X		

MISCELLANEOUS

ITEM No.	PART NAME	Columbia PART No.	NOTES
M3	Switch	19B616	Function Switch, with 2 AC Switches

AMP CHASSIS BOTTOM VIEW



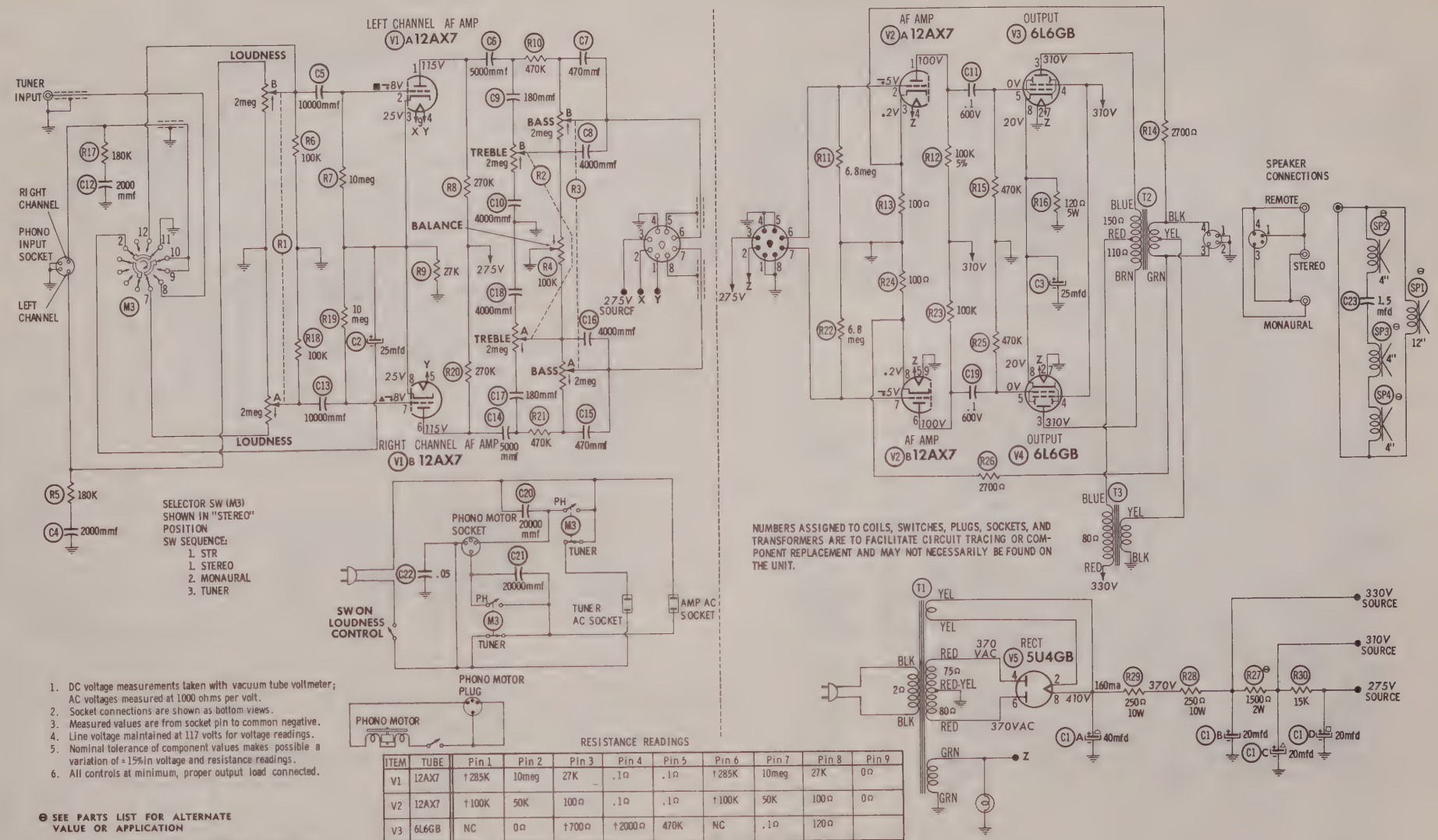
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knobs	8B483	Model 634
Knobs	8B494	Model 680
Cabinet	17B981	Mahogany, Model 634
Cabinet	17B982	Blond, Model 634
Cabinet	17B983	Walnut, Model 634
Cabinet	17B998	Mahogany, Model 680
Cabinet	17B999	Blond, Model 680
Cabinet	17B801	Walnut, Model 680
Speaker Cabinet	17B806	Mahogany, Model 680
Speaker Cabinet	17B807	Blond, Model 680
Speaker Cabinet	17B808	Walnut, Model 680

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No.	1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No.	8401
Phono Pick-up Arm Cable	Use BELDEN No.	8430 (Two Conductor - Twisted)



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of components values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†285K	10meg	27K	.1Ω	.1Ω	†285K	10meg	27K	0Ω
V2	12AX7	†100K	50K	100Ω	.1Ω	.1Ω	†100K	50K	100Ω	0Ω
V3	6L6GB	NC	0Ω	†700Ω	†2000Ω	470K	NC	.1Ω	120Ω	
V4	6L6GB	NC	.1Ω	†700Ω	†2000Ω	470K	NC	0Ω	120Ω	
V5	5U4GB	NC	¶	NC	75Ω	NC	80Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V5.
■ MEASURED FROM PIN 3 OF V1.
▲ MEASURED FROM PIN 8 OF V1.
NC NO CONNECTION

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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COLUMBIA
MODELS 634, 680

PHOTOFACT* Folder with CIRCUITRACE*

COLUMBIA
MODEL 683

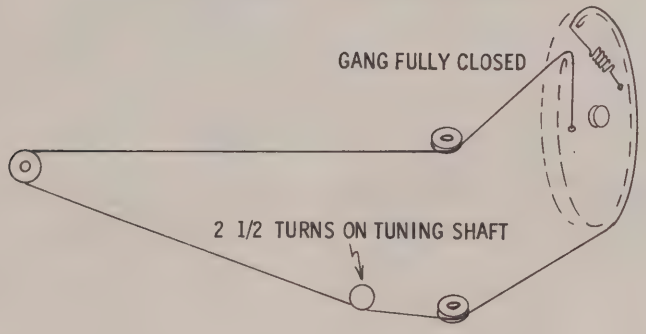
COLUMBIA
MODEL 683

COLUMBIA
MODEL 683

TRADE NAME	Columbia Model 683
MANUFACTURER	CBS-Hytron, 100 Endicott St., Danvers, Mass.
TYPE SET	AC Operated 7 Tube FM-AM Tuner And 4 Tube Preamp-Stereo Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles
RATING	28 Watts, .30 Amp. @117 Volts AC (Tuner) 40 Watts, .42 Amp. @117 Volts AC (Amp)
TUNING RANGE — BROADCAST 530 — 1650KC	

FOR SERVICE INFORMATION ON RECORD CHANGER — SEE V-M 1200A — PHOTOFACT SET 353 FOLDER 16
OR RECORD CHANGER MANUAL RC-10

DIAL CORD STRINGING



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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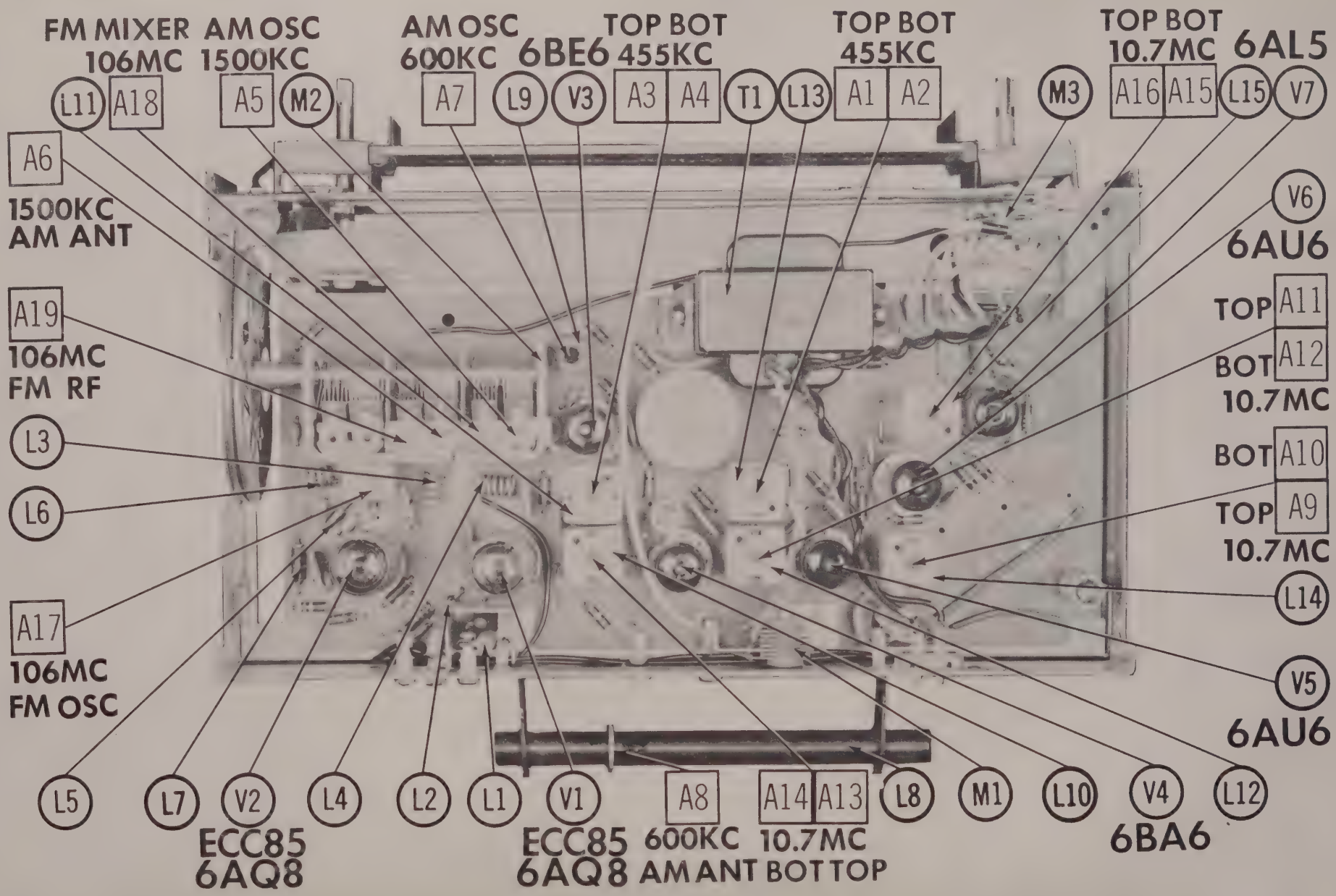
JN182



TUNER CHASSIS - TUBE, INDUCTOR, MISC. & ALIGN IDENT.

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Output of signal generator should be no higher than necessary to obtain an output reading.
Suggested alignment tools:
A1 thru A4, A9 thru A16..... GENERAL CEMENT #5097, 8727
WALSCO #2515
A5, A6, A17, A18, A19..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A7..... GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.1mfd	High side to antenna lug of AM tuning gang.	455KC (400∿ Mod.)	AM	Tuning gang fully open	AC probe to tuner output. Common to chassis.	A1, A2, A3, A4	Adjust for maximum output.
2.	"	High side to AM antenna terminal. Low side to chassis.	1500KC	"	1500KC	"	A5, A6	"
3.	"	"	600KC	"	600KC	"	A7, A8	Adjust for maximum output. Repeat Step 2.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	.001mfd	High side to Pin 7 (grid) of FM converter. Low side to chassis.	10.7MC (Unmod.)	FM	Tuning gang fully open	DC probe to point (A). Common to chassis.	A9, A10, A11, A12, A13, A14	Adjust for maximum deflection.
5.	"	"	"	"	"	DC probe thru 1meg to point (B) Common to chassis.	A15	"
6.	"	"	"	"	"	DC probe to point (C). Common to chassis.	A16	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	.001mfd	High side to pin 7 (grid) of FM mixer. Low side to chassis.	10.7MC (450KC Swp)	FM	Tuning gang fully open	Vert. amp. to point (A). Low side to chassis.	A9, A10, A11, A12, A13, A14	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown.
5.	"	"	"	"	"	Vert. amp. to point (B). Low side to chassis.	A15	"
6.	"	"	"	"	"	Vert. amp. to point (C). Low side to chassis.	A16	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A15 for maximum amplitude and straightness crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	Two 120Ω Resistors	Across FM antenna terminals with 120Ω in each lead.	106MC (Unmod.)	FM	106MC	DC probe to point (A). Common to chassis.	A17, A18, A19	Adjust for maximum deflection.
8.	"	"	90MC	"	90MC	"	L6, L4, L3	"

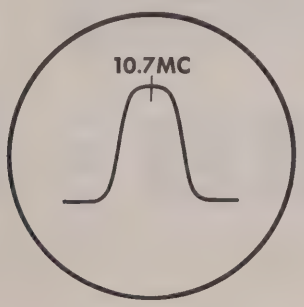


FIG. 1

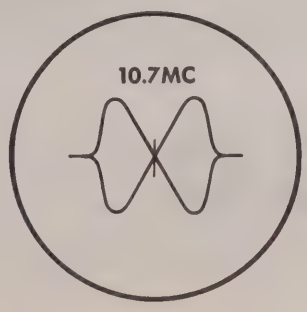
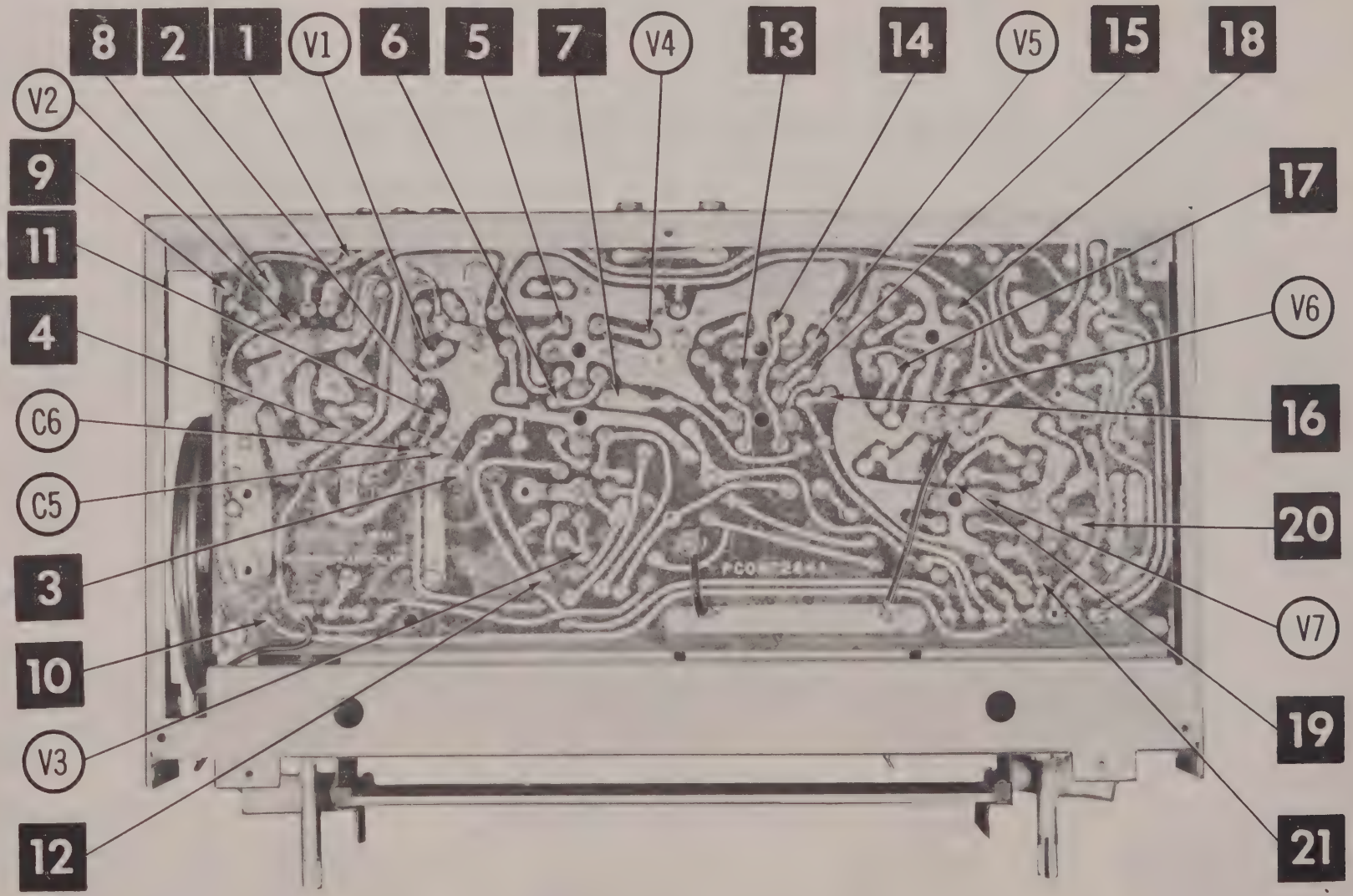


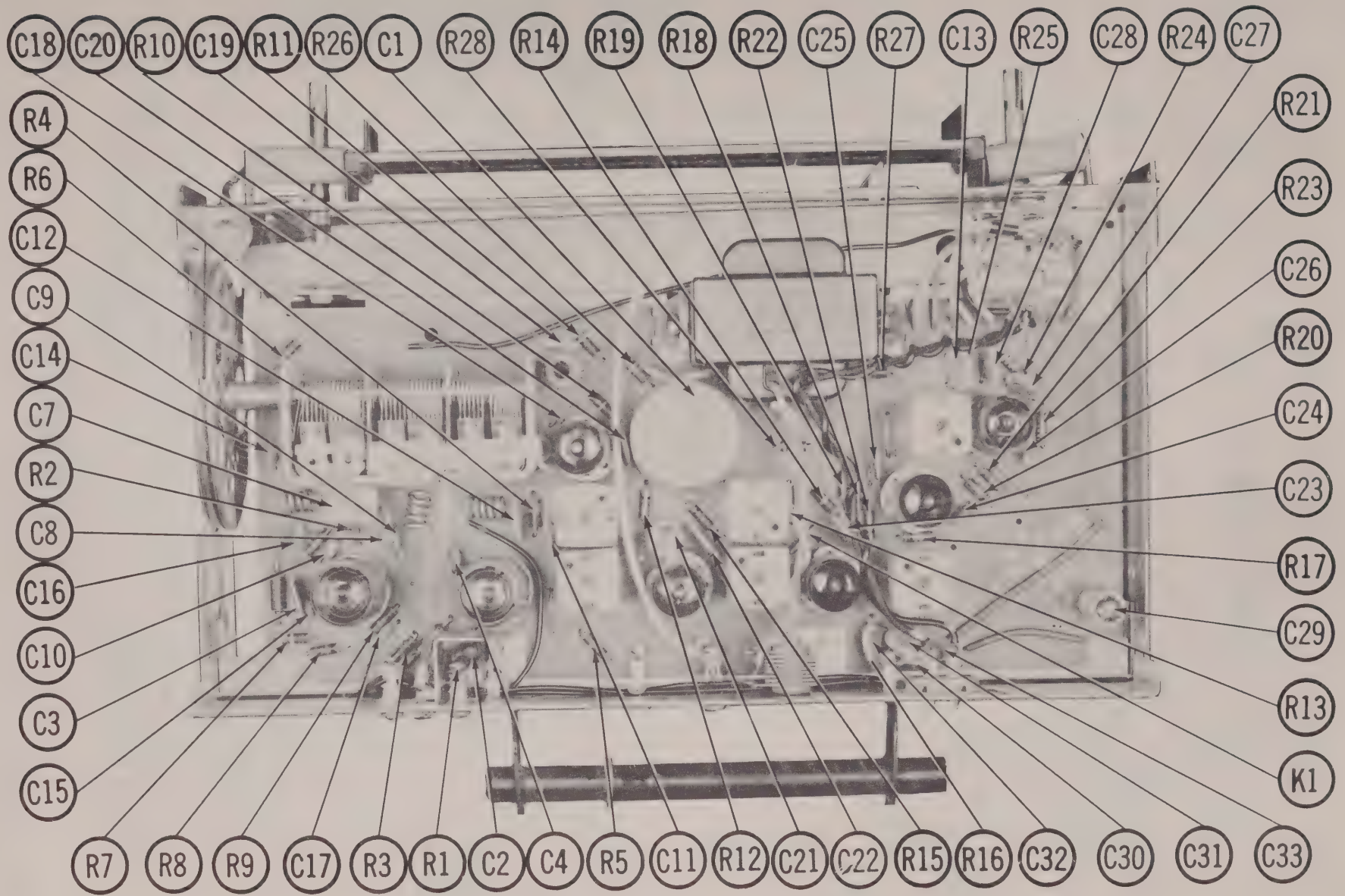
FIG. 2



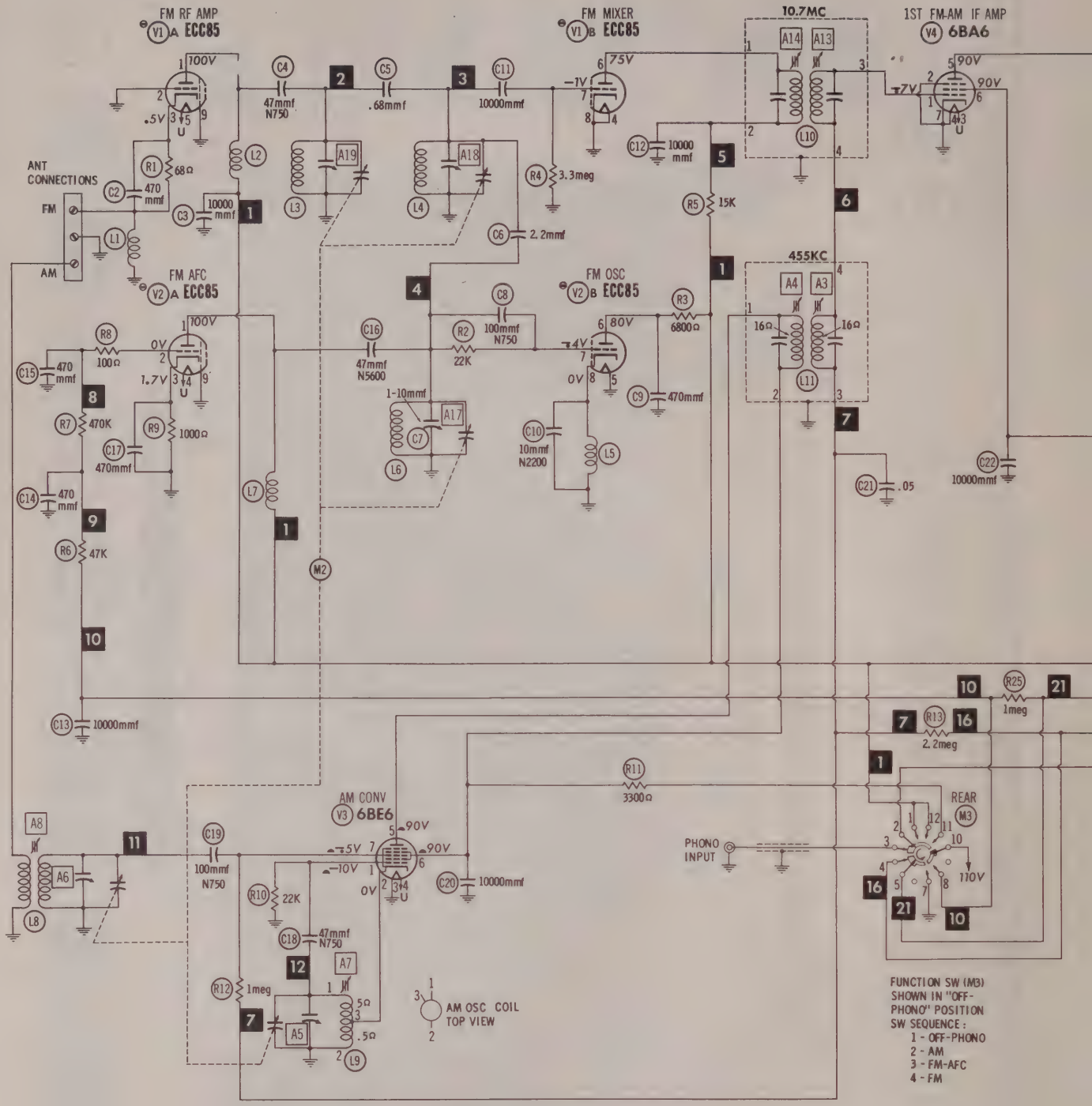
A Howard W. Sams CIRCUITRACE® Photo

PRINTED BOARD - TUNER CHASSIS

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



TUNER CHASSIS - RESISTOR & CAPACITOR IDENT.



⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. No signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

with CIRCUITRACE

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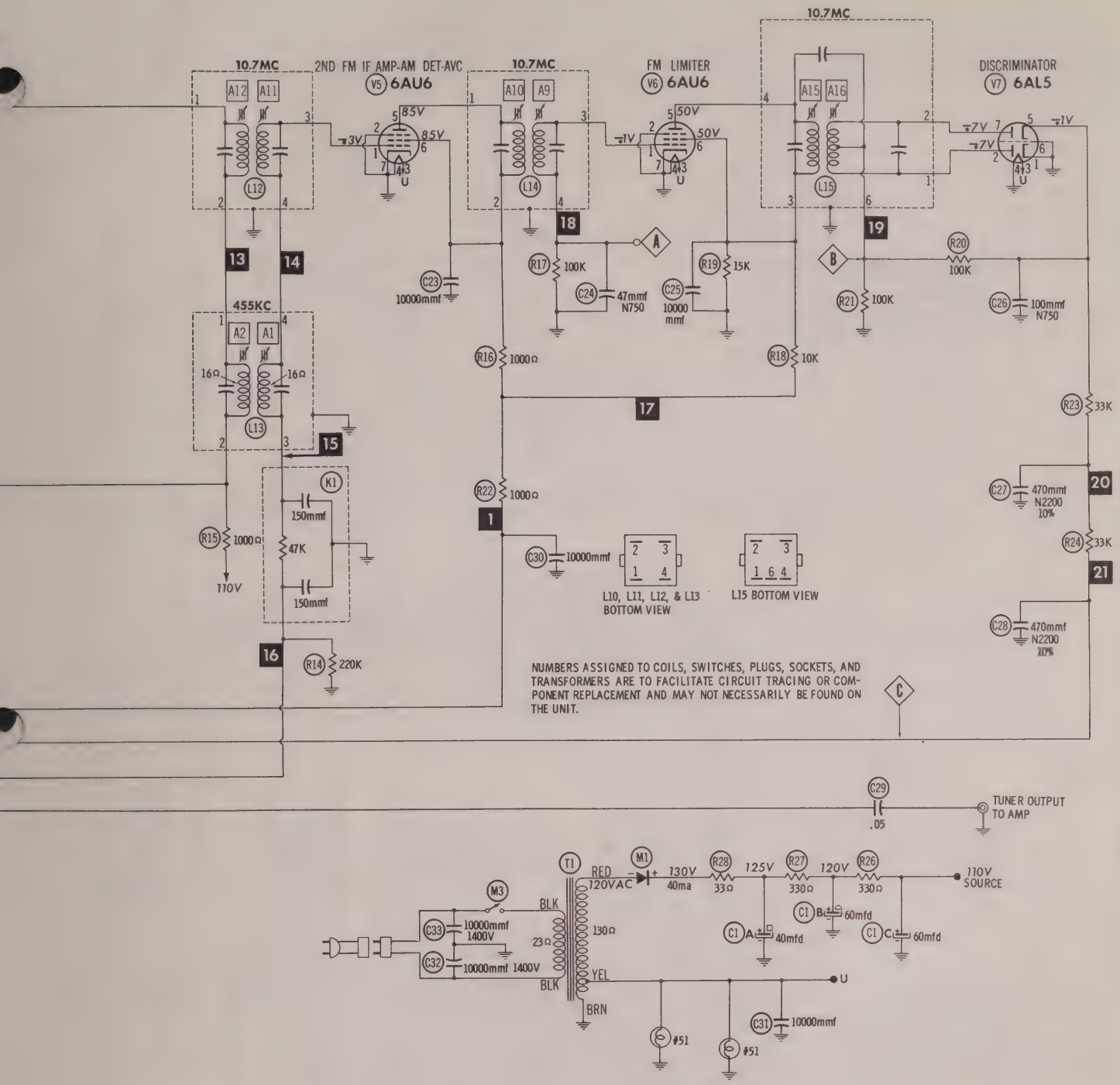
TUNER SCHEMATIC



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC85 6AQ8	†690Ω	0Ω	68Ω	0Ω	.1Ω	†16K	3.3meg	0Ω	0Ω
V2	ECC85 6AQ8	†690Ω	520K ■1.6meg	1000Ω	.1Ω	0Ω	†7500Ω	22K	.1Ω	0Ω
V3	6BE6	22K	.5Ω	0Ω	.1Ω	☁†4000Ω	☁†4000Ω	☁3.4meg		
V4	6BA6	2.4meg	0Ω	.1Ω	0Ω	†1700Ω	†1700Ω	0Ω		
V5	6AU6	270K	0Ω	.1Ω	0Ω	†2700Ω	†2700Ω	0Ω		
V6	6AU6	100K	0Ω	.1Ω	0Ω	†11K	†11K	0Ω		
V7	6AL5	0Ω	100K	.1Ω	0Ω	200K	0Ω	100K		

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
■ MEASURED IN "FM-AFC" POSITION.
† MEASURED FROM OUTPUT OF M1
☁ MEASURED IN "AM" POSITION.

COLUMBIA MODEL 683

TUNER PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM RF Amp. - FM Mixer	ECC85/ 6AQ8	
V2	FM Osc. - FM AFC	ECC85/ 6AQ8	
V3	AM Converter	6BE6	
V4	1st FM-AM IF Amp.	6BA6	
V5	2nd FM IF Amp. - AM Det. -AVC	6AU6	
V6	FM Limiter	6AU6	
V7	Discriminator	6AL5	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA COLUMBIA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▪40	150	11C714			PFP311.53		PCL-3443.5	
B	▪60	150							
C	60	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	REPLACEMENT DATA COLUMBIA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	470				SI 470	DD-471	BYA10T47	B-347	5GA-T47	
C3	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C4	47		N750		N750-DI 47	DTN-47	C10Q47U	CN7-447	5TCU-Q47	
C5	.68					TCZ-R68				
C6	2.2				NPO-SI 2.2	TCZ-2R2	C10V22C	CNO-522	5TCCB-V22	
C7	1-10			14C102		829-10				
C8	100		N750		N750-DI 100	DTN-100	C10T1U	CN7-310	5TCU-T1	
C9	470				BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C10	10		N2200							
C11	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C12	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C13	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C14	470				BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C15	470				BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C16	47		N5600							
C17	470				BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C18	47		N750		N750-DI 47	DTN-47	C10Q47U	CN7-447	5TCU-Q47	
C19	100		N750		N750-DI 100	DTN-100	C10T1U	CN7-310	5TCU-T1	
C20	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C21	.05	200			P288N-05	DF-503	BC2S47J	GEM-215	2TM-S5	
C22	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C23	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C24	47		N750		N750-DI 47	DTN-47	C10Q47U	CN7-447	5TCU-Q47	
C25	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C26	100		N750		N750-DI 100	DTN-100	C10T1U	CN7-310	5TCU-T1	
C27	470		N2200 10%							
C28	470		N2200 10%							
C29	.05	200			P288N-05	DF-503	BC2S47J	GEM-215	2TM-S5	
C30	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C31	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C32	10000	1400				DD16-103	HVE16S1	2HV-110	20HKB-S1	
C33	10000	1400				DD16-103	HVE16S1	2HV-110	20HKB-S1	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	COLUMBIA PART No.	REPLACEMENT DATA
K1	AM Det. RF Filter	150mmf, 150mmf, 47K	5C303	Aerovox PA-98 Cornell-Dubilier 111TM2 Centralab PC-51 Sprague D-2

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	COLUMBIA PART No.	NOTES
R1	68Ω			
R2	22K			
R3	6800Ω			
R4	3.3meg			
R5	15K			
R6	47K			
R7	470K			
R8	100Ω			
R9	1000Ω			
R10	22K			
R11	3300Ω			
R12	1meg			
R13	2.2meg			
R14	220K			
R15	1000Ω			
R16	1000Ω			
R17	100K			
R18	10K			
R19	15K			
R20	100K			
R21	100K			
R22	1000Ω			
R23	33K			
R24	33K			
R25	1meg			
R26	330Ω			
R27	330Ω			
R28	33Ω			

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA COLUMBIA PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	FM Ant. Coil	21C202				4584		.24uh ①
L2	RF Choke	21C203						3.3uh
L3	FM RF Coil							
L4	FM Mixer Coil							
L5	Cathode Choke	21C201	19-1000	19-1000	BC-561	4602		1uh
L6	FM Osc. Coil							
L7	RF Choke	21C203						3.3uh
L8	Loopstick	19C549						
L9	AM Osc. Coil	20C319						
L10	1st FM IF Trans.	20C313	16-3490	16-3490		1463-PC		
L11	1st AM IF Trans.	20C317	16-6780	16-6780	BC-356	13-PC1	RF-4	
L12	2nd FM IF Trans.	20C314	16-3490	16-3490		1463-PC		
L13	2nd AM IF Trans.	20C318	16-6780	16-6780	BC-357	13-PC2	RF-4	
L14	3rd FM IF Trans.	20C315	16-3490	16-3490		1463-PC		
L15	Discriminator	20C316						

① IRC Part #CLA.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	REPLACEMENT DATA COLUMBIA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ⓐ .30A	120V ⓐ .040A tap ⓐ 6.3V ⓐ 2.5A	2C105						

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA COLUMBIA PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.042A	10C610	RS065 ①	1002A ①	65 ① M150 ②		① Selenium ② Silicon

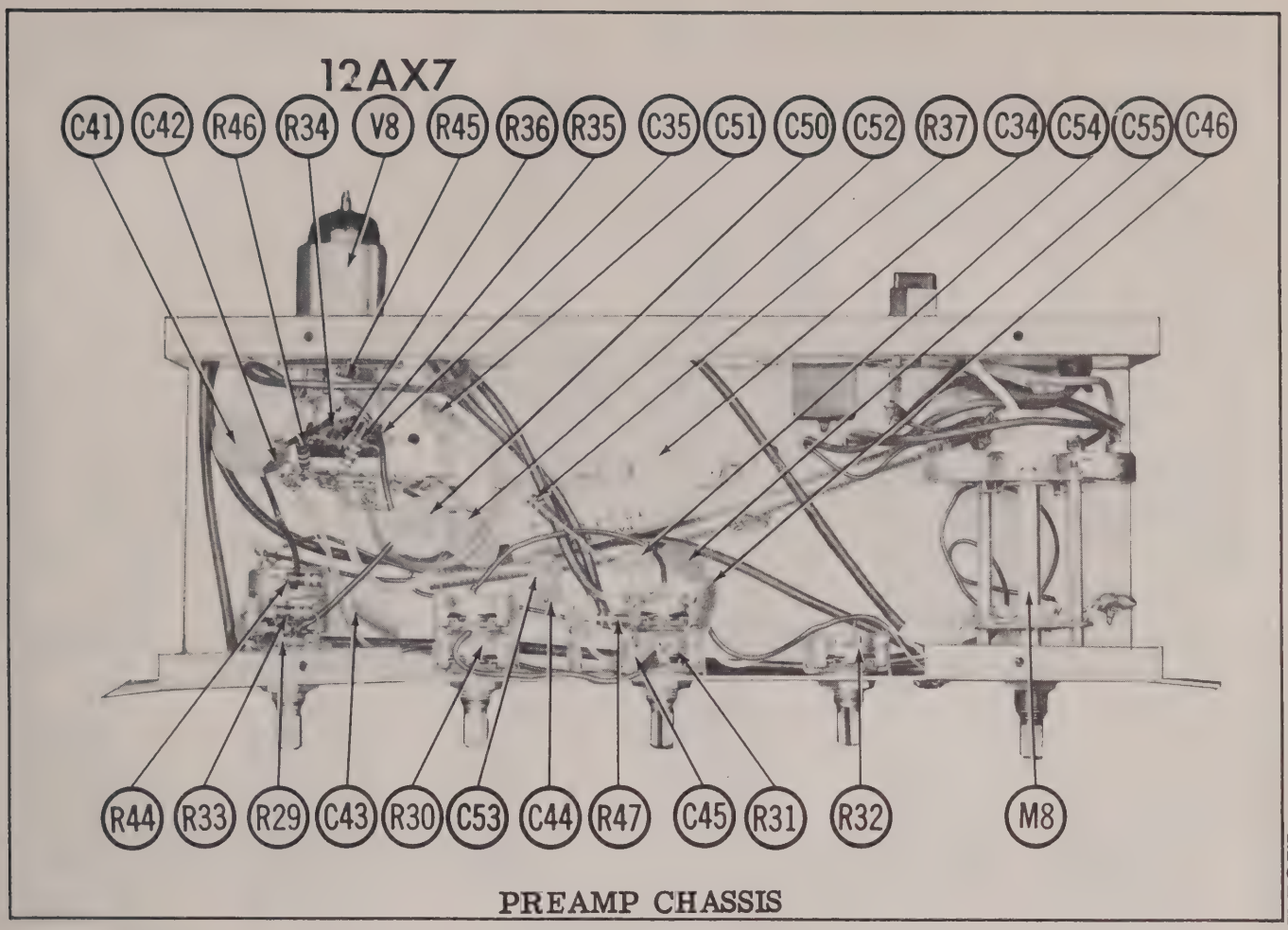
MISCELLANEOUS

ITEM No.	PART NAME	COLUMBIA PART No.	NOTES
M2	Tuning Cap.	14C105	FM-AM, 6 Gang
M3	Switch	19C57A	Function
	Printed Board	PCOM2264A	

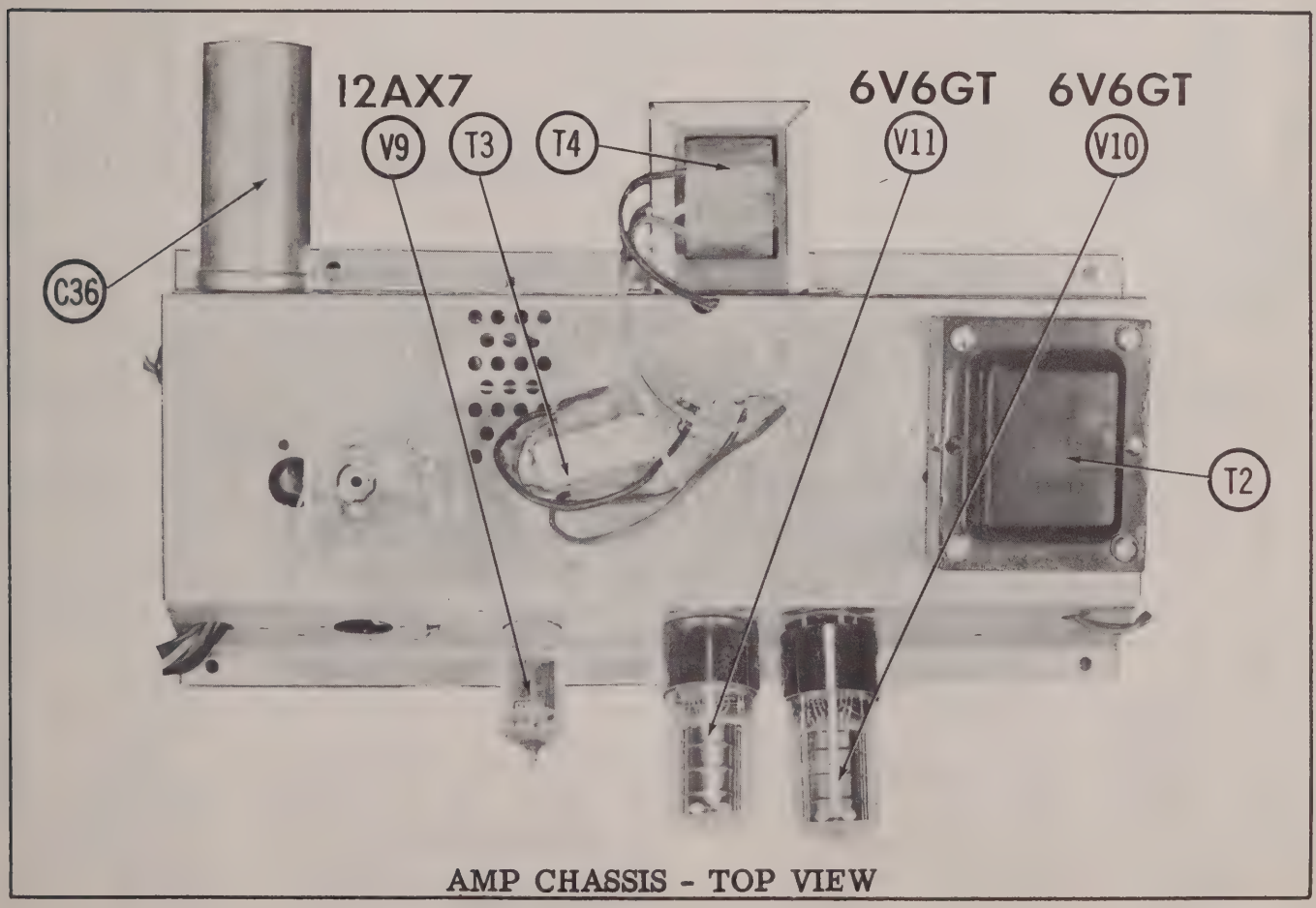
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)



PREAMP CHASSIS



AMP CHASSIS - TOP VIEW

AMP PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V8	Channel A AF Amp. - Channel B AF Amp.	12AX7	
V9	Channel A AF Amp. - Channel B AF Amp.	12AX7	

ITEM No.	USE	TYPE	NOTES
V10	Channel A Output	6V6GT	
V11	Channel B Output	6V6GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA COLUMBIA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C34	20	450	11A740	PRS450V20	BR20-35	TC65	TD-20-350	TVA-1608	
C35	25	25	①	PRS25V25	BBR25-25	TC26	TD-25-25	TVA-1205	
C36A	▲40	150	11A705	AFH3-44	C1100	FP369.1	TMT-144	TVL-3758	
B	■40	150							
C	▲40	150							
C37	40	150	11A704	PRS150V40	BR40-15	TC48	TD-40-150	TVA-1413	
C38	20	450	11A740	PRS450V20	BR20-35	TC65	TD-20-350	TVA-1608	
C39	50	50	①	SRE25V50	BBR50-25	TC29	TD-50-25	TVA-1206	
C40	2	50NP	11A716	NP-PRS50V NP2	BBR4-50 †	TCN503		TVAS-1303.1*	

① Some versions may use 20mfd @ 25V in this application (Part #11A739).
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
† Use 2 units. Connect negative terminals together. Connect positive terminals into circuit the same as the original non-polarized unit.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	REPLACEMENT DATA COLUMBIA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C41	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C42	5000				BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C43	180	3000			HVD-30-180	DD30-181	HVB30T18		30GA-T18	
C44	2000				BPD-002	DD-202	BYA10D2	B-220	5HK-D2	
C45	470				BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C46	5000				BPD-005	DD-502	BYA10D5	B-250	5HK-D5	①
C47	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C48	.01	400			P488N-01	DD-103	CUB4S1	GEM-411	4TM-S1	
C49	.001	1000			P1088N-001	DD-102	CUB10D1	GEM-1021	10TM-D1	
C50	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C51	5000				BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C52	180	3000			HVD-30-180	DD30-181	HVB30T18		30GA-T18	
C53	2000				BPD-002	DD-202	BYA10D2	B-220	5HK-D2	
C54	470				BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C55	5000				BPD-005	DD-502	BYA10D5	B-250	5HK-D5	①
C56	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C57	.01	400			P488N-01	DD-103	CUB4S1	GEM-411	4TM-S1	
C58	.001	1000			P1088N-001	DD-102	CUB10D1	GEM-1021	10TM-D1	
C59	.05	400					CUB16S5	GEM-1615	TR-15	

① Some versions may use 4000mmf in this application.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA COLUMBIA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R29A	2meg	½	9A608	B-76	AD47-2meg-S	Q13-139		Loudness, Channel A
B	2meg	½		SR-76	Not Req.	M13-139	† UE1873-3	Loudness, Channel B
C	Shaft			Not Req.	KSS-3	Not Req.		
D	Switch			KR-1	SWE-12	76-1		Power On-Off
R30A	2meg	½	9A599	B-76	AD47-2meg-S	Q13-139		Treble, Channel A
B	2meg	½		SR-76	Not Req.	M13-139	‡ UE1877	Treble, Channel B
C	Shaft			Not Req.	KSS-3	Not Req.		

CONTROLS (cont)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA COLUMBIA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R31A	2meg	½	9A599	B-76	AD47-2meg-S	Q13-139		Bass, Channel A
B	2meg			SR-76	Not Req.	M13-139	‡ UE1877	Bass, Channel B
C	Shaft			Not Req.	KSS-3	Not Req.		
R32A	100K	½	9A600	B-40	A47-100K-S	Q11-128	U41	Balance
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

† " STA-LOC" Equivalent: FA26A, RU26A, CS3500, US41. ‡ "STA-LOC" Equivalent: FA26A, RU26A, CS3500.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	COLUMBIA PART No.	NOTES
R33	100K			
R34	10meg			
R35	270K			
R36	33K			Note 1
R37	470K			
R38	6.8meg			
R39	100K			
R40	100Ω 5%			
R41	2700Ω 5%			
R42	470K			
R43	220Ω	5	16A409	
R44	100K			
R45	10meg			

ITEM No.	RATING OHMS	RATING WATT	COLUMBIA PART No.	NOTES
R46	270K			
R47	470K			
R48	6.8meg			
R49	100K			
R50	100Ω			
R51	2700Ω 5%			
R52	470K			
R53	15K	1		
R54	10K	1		
R55	220Ω	5	16A409	
R56	220Ω	5	16A409	
R57	68Ω			
R58	68Ω			

Note 1. Some versions may use 27K in this application.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA COLUMBIA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	117V @ .42A	120V @ .2A (AC)	6.3V @ 1.65A	2A102						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA COLUMBIA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T3	6500Ω CT	6-8Ω CT	3A234							
T4	2300Ω	1-2Ω	3A235							

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA COLUMBIA PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	10"	PM	3-4Ω	1A123	10A6A	
SP2	4"	PM	3-4Ω	1A122	4A1	
SP3	4"	PM	3-4Ω	1A122	4A1	
SP4	4"	PM	3-4Ω	1A122	4A1	

AMP PARTS LIST AND DESCRIPTIONS (Cont)

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA COLUMBIA PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M4	.082A	10A611	1101A ①	RS100A ①	100A ① M150 ②		① Selenium Type. ② Silicon Type.
M5	.082A	10A612	1101A ①	RS100A ①	100A ① M150 ②		

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA COLUMBIA PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	REMARKS
M6		* 13-TB				* Includes Needles & Mounting Mechanism

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA COLUMBIA PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M7		S69X † or S69XSD †♦ or S69XDD ♦	W-103STSS † or W-103STDS ♦†	† Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	COLUMBIA PART No.	NOTES
M8	Switch		Function (Radio-Monaural-Stereo)

CABINETS & CABINET PARTS

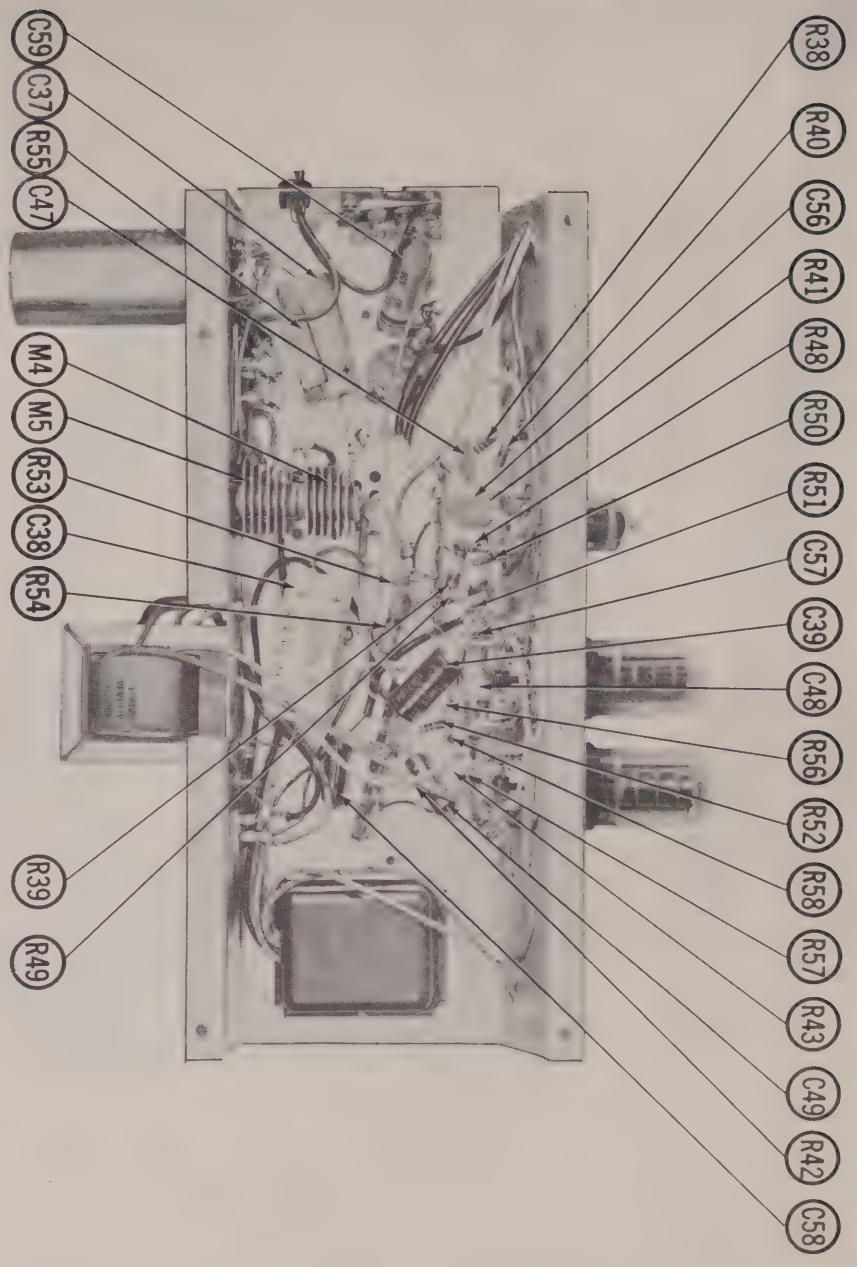
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

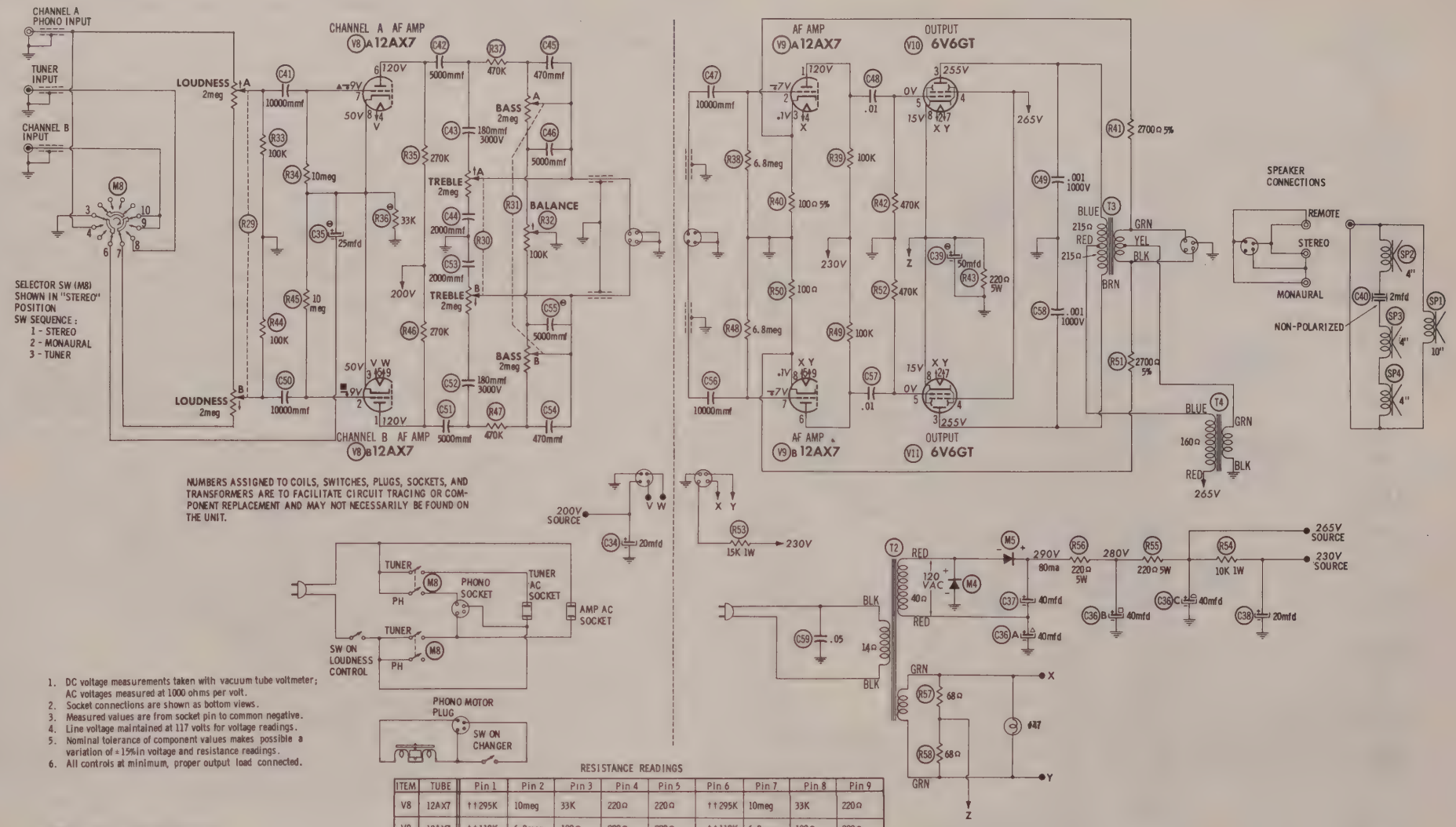
NAME	PART NO.	DESCRIPTION
Knobs	8A477	
Dial Pointer	19C580	
Dial Glass	19C579	
Cabinet	17A975	Mahogany
Cabinet	17A976	Blonde
Cabinet	17A977	Walnut

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

AMP CHASSIS BOTTOM VIEW





1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V8	12AX7	††295K	10meg	33K	220Ω	220Ω	††295K	10meg	33K	220Ω
V9	12AX7	††110K	6.8meg	100Ω	220Ω	220Ω	††110K	6.8meg	100Ω	220Ω
V10	6V6GT	NC	220Ω	††815Ω	††440Ω	470K	NC	220Ω	220Ω	
V11	6V6GT	NC	220Ω	††815Ω	††440Ω	470K	TP	220Ω	220Ω	

†† MEASURED FROM OUTPUT OF M5.
▪ MEASURED FROM PIN 3 OF V3.
▲ MEASURED FROM PIN 8 OF V3.
NC NO CONNECTION
TP TIE POINT

Ⓢ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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COLUMBIA MODEL 683

PREAMP - AMP SCHEMATIC

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

CONTINENTAL MODEL P-50

CONTINENTAL MODEL P-50

CONTINENTAL MODEL P-50

TRADE NAME	Continental Model P-50
IMPORTER	Continental Merchandise Co., Inc., 236 Fifth Ave., New York 1, N. Y.
TYPE SET	Battery Operated 4 Tube Portable AM Receiver
POWER SUPPLY	1.5 Volts DC "A" Supply & 45 Volts DC "B" Supply
RATING	200MA @ 1.5 Volts DC & 8.5MA @ 45 Volts DC
TUNING RANGE—BROADCAST	535 - 1605KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1, A2, A3, A4, A6 ... GENERAL CEMENT #8271, 8273, 8275, 8276, 8721, 8722, 9150, 9298, 5003
WALSCO #2516, 2519

A5, A7 ..... GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.		Loop	455KC (400~ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.		"	1605KC	"	"	A5	"
3.		"	600KC	600KC	"	A6	"
4.		"	1400KC	1400KC	"	A7	"

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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JF207

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	1R5	
V2	IF Amplifier	1T4	

ITEM No.	USE	TYPE	NOTES
V3	Det. - AVC - AF Amp.	1U5	
V4	Output	3S4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Continental PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	10	75		PRS150V10	BBR10-90	TC42	TD-10-150	TVA-1406	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	Continental PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C3	50				SI 50	D6-500	L10Q5	UC-545	5GA-Q5	
C4	100				SI 100	D6-101	L10T1	UC-531	5GA-T1	
C5	100				SI 100	D6-101	L10T1	UC-531	5GA-T1	
C6	2000				BPD-002	DD-202	BYA10D2	B-220	5HK-D2	
C7	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C8	100				SI 100	D6-101	L10T1	UC-531	5GA-T1	
C9	2000				BPD-002	DD-202	BYA10D2	B-220	5HK-D2	
C10	2000				BPD-002	DD-202	BYA10D2	B-220	5HK-D2	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Continental PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	1meg	½						Volume and Switch

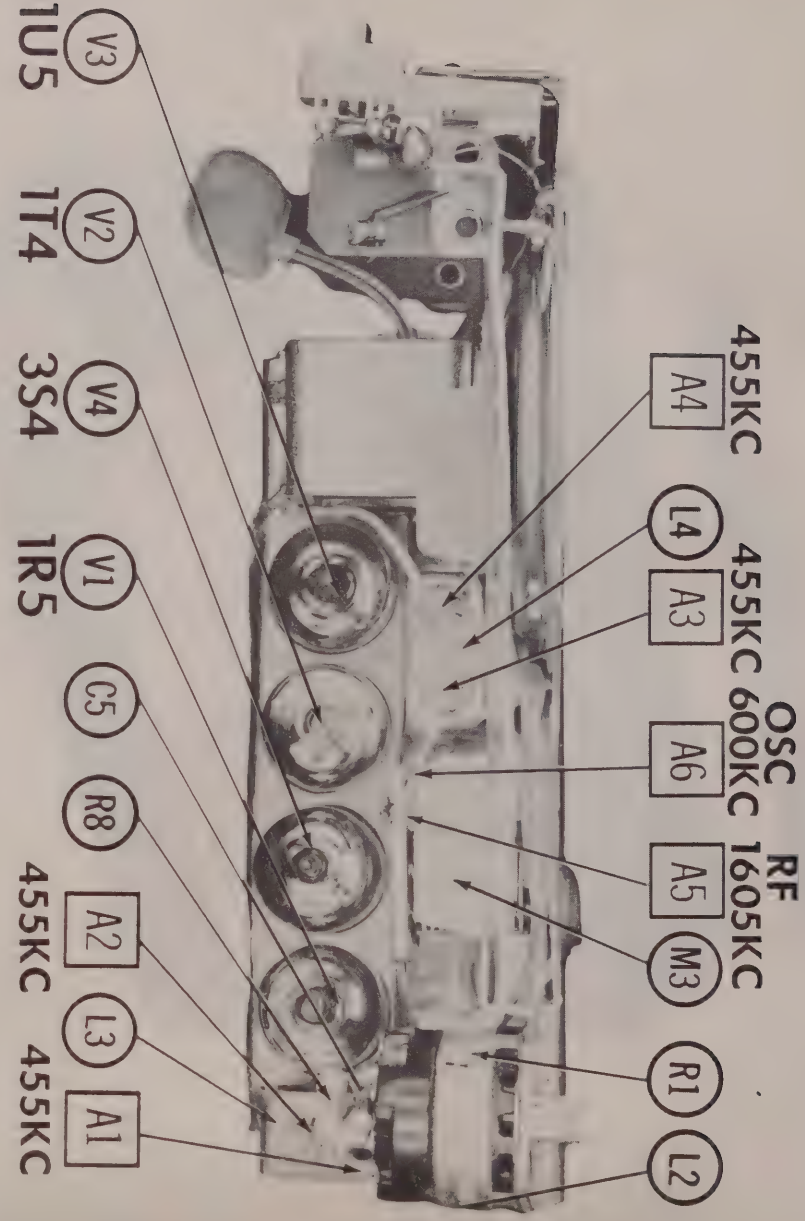
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		Continental PART No.	NOTES
	OHMS	WATT		
R2	100K			
R3	3meg			
R4	5meg			
R5	1meg			

ITEM No.	RATING		Continental PART No.	NOTES
	OHMS	WATT		
R6	5meg			
R7	3meg			
R8	470Ω			

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		Continental PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1 L2 L3 L4	Loopstick Osc. Coil Input IF Output IF							

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	Continental PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	5500Ω	12-15Ω								

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Continental PART No.	QUAM PART No.	
SP1	2½"	PM	12-15Ω		25A07Z14.6	

BATTERIES

ITEM No.	VOLTAGE	Continental PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V		2R		A100		M-13R RM-42R①		① Mercury Type
M2	45V			U30		415		M-213 RM-415R①	

MISCELLANEOUS

ITEM No.	PART NAME	Continental PART No.	NOTES
M3	Tuning Cap.		2 Gang (Ant. 13-200mmf)

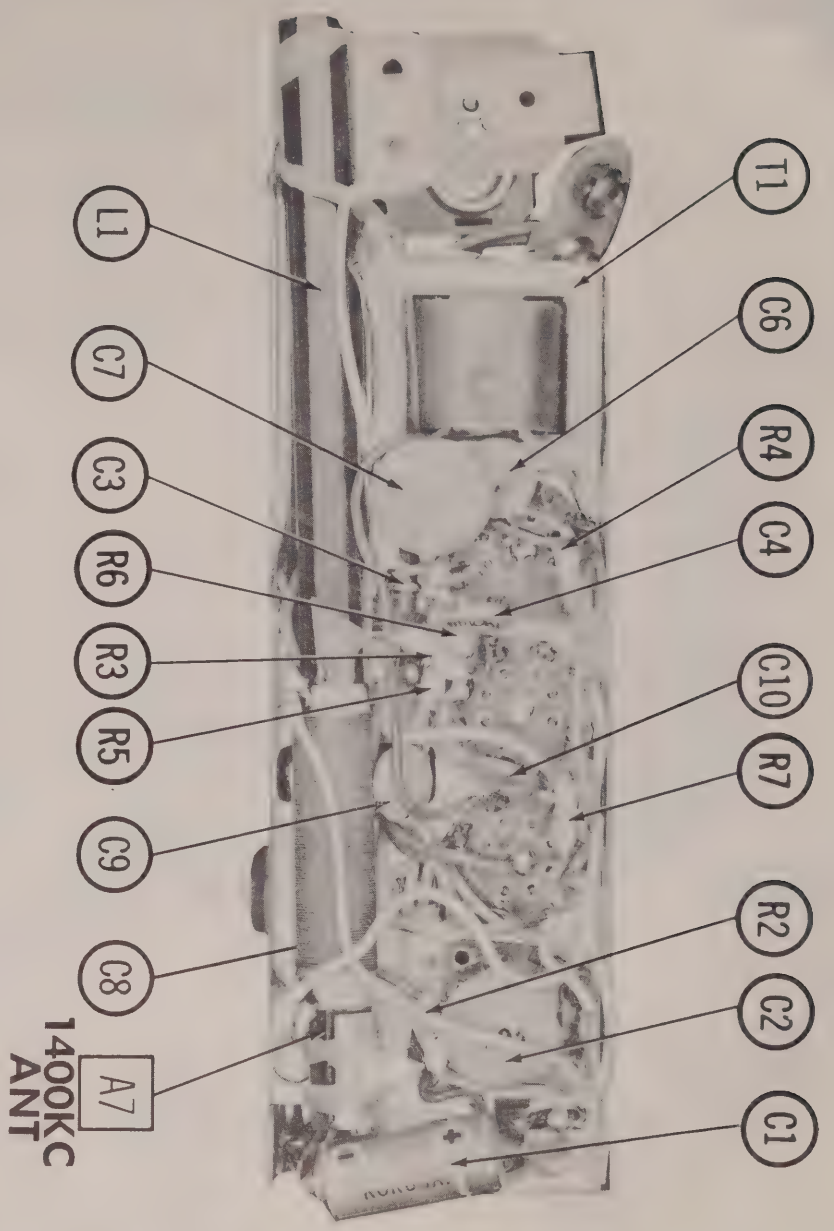
CABINETS & CABINET PARTS

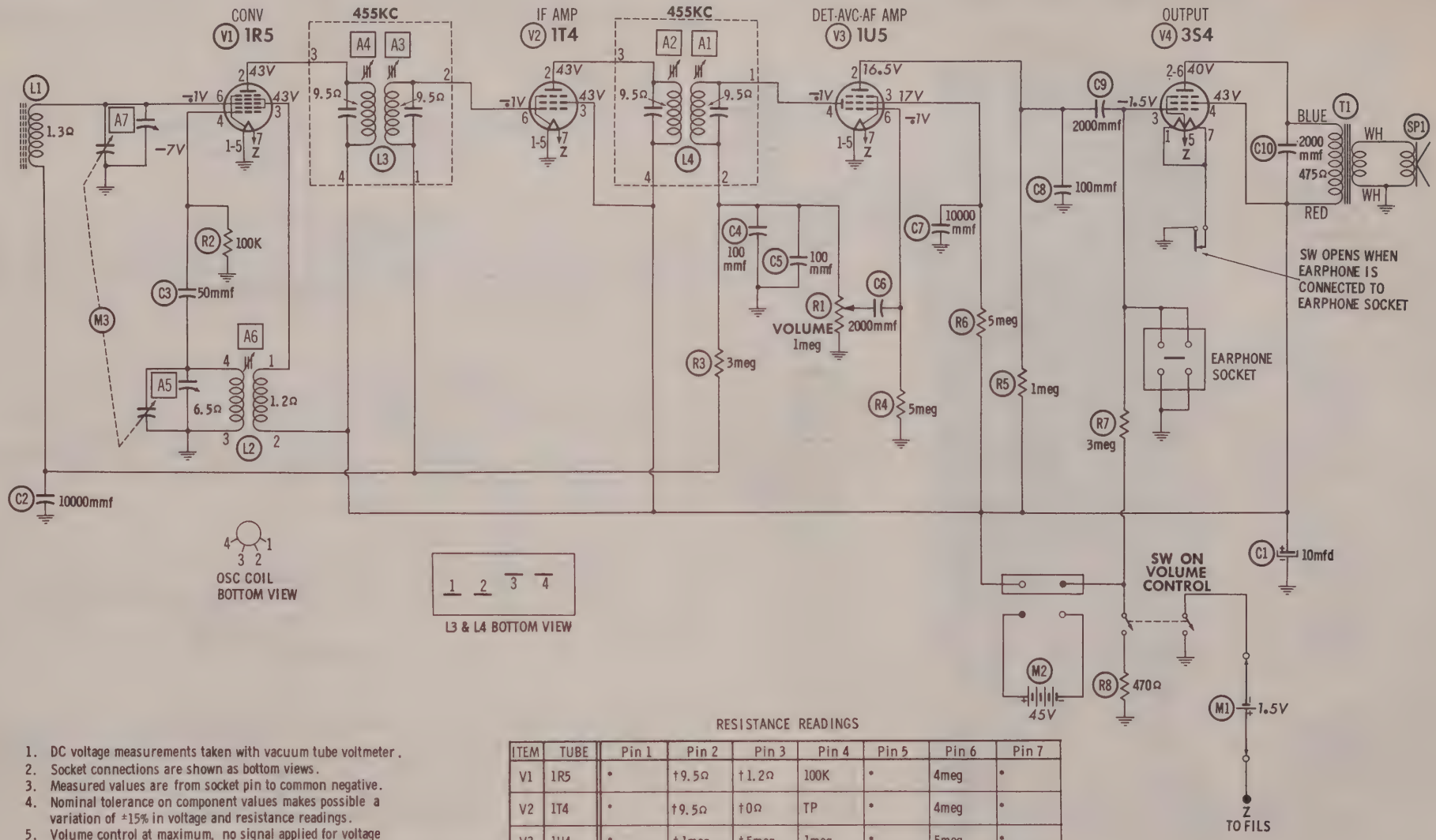
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors

CHASSIS BOTTOM VIEW





1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	1R5	•	†9.5Ω	†1.2Ω	100K	•	4meg	•
V2	1T4	•	†9.5Ω	†0Ω	TP	•	4meg	•
V3	1U4	•	†1meg	†5meg	1meg	•	5meg	•
V4	3S4	•	†475Ω	3meg	†0Ω	•	†475Ω	•

• DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE
† MEASURED FROM POSITIVE TERMINAL OF C1.
TP TIE POINT

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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CONTINENTAL MODEL P-50

PHOTOFACT* Folder
with CIRCUITRACE*

EMERSON MODELS 896B, 902
(Ch. 120455B, 120459B)

EMERSON MODELS 896B, 902
(Ch. 120455B, 120459B)

MODEL 896B

TRADE NAME	Emerson Models 896B (Ch. 120455B), 902 (Ch. 120459B)
MANUFACTURER	Emerson Radio & Phono Corp., 524 W. 23rd St., New York 11, N. Y.
TYPE SET	AC Operated 2 Tube AM Tuner and 3 Tube Stereo Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles
RATING	58 Watts, .575 Amp. @ 117 Volts AC (Radio)
TUNING RANGE—BROADCAST	540 - 1620KC

FOR SERVICE INFORMATION ON RECORD CHANGER PART #819126, 819129 (MODEL 896B) OR 819131 (MODEL 902) - SEE SIMILAR GLASER - STEERS GS-77 - PHOTOFACT SET 399 FOLDER 7

EMERSON MODELS 896B, 902
(Ch. 120455B, 120459B)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Loudness control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1 thru A4 ..... GENERAL CEMENT #5097, 8727
WALSCO #2515
A5, A6 ..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

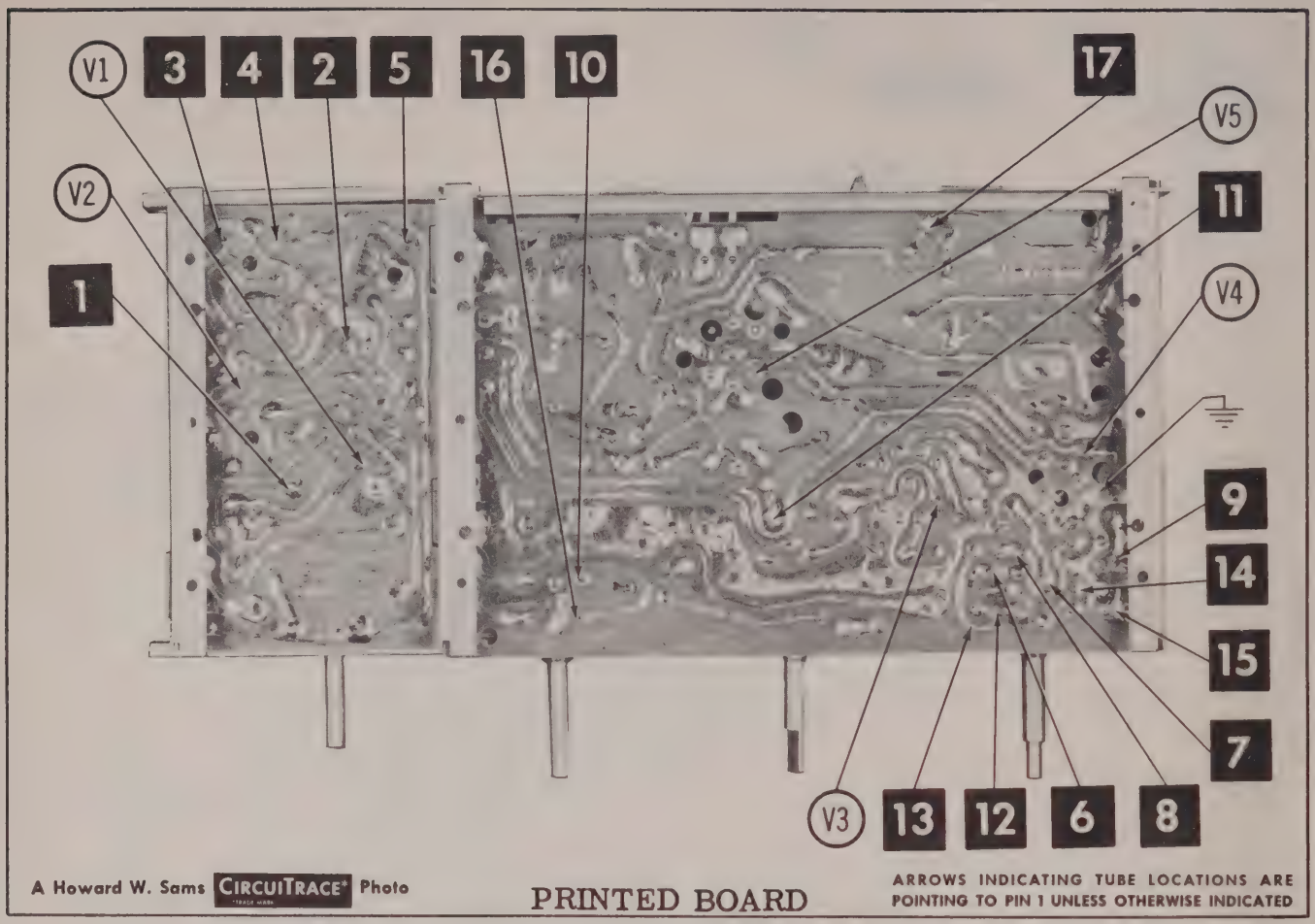
	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.005mfd	High side to pin 7 (grid) of Converter. Low side to chassis.	455KC (400~ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	1400KC signal	"	A6	"

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

JP185

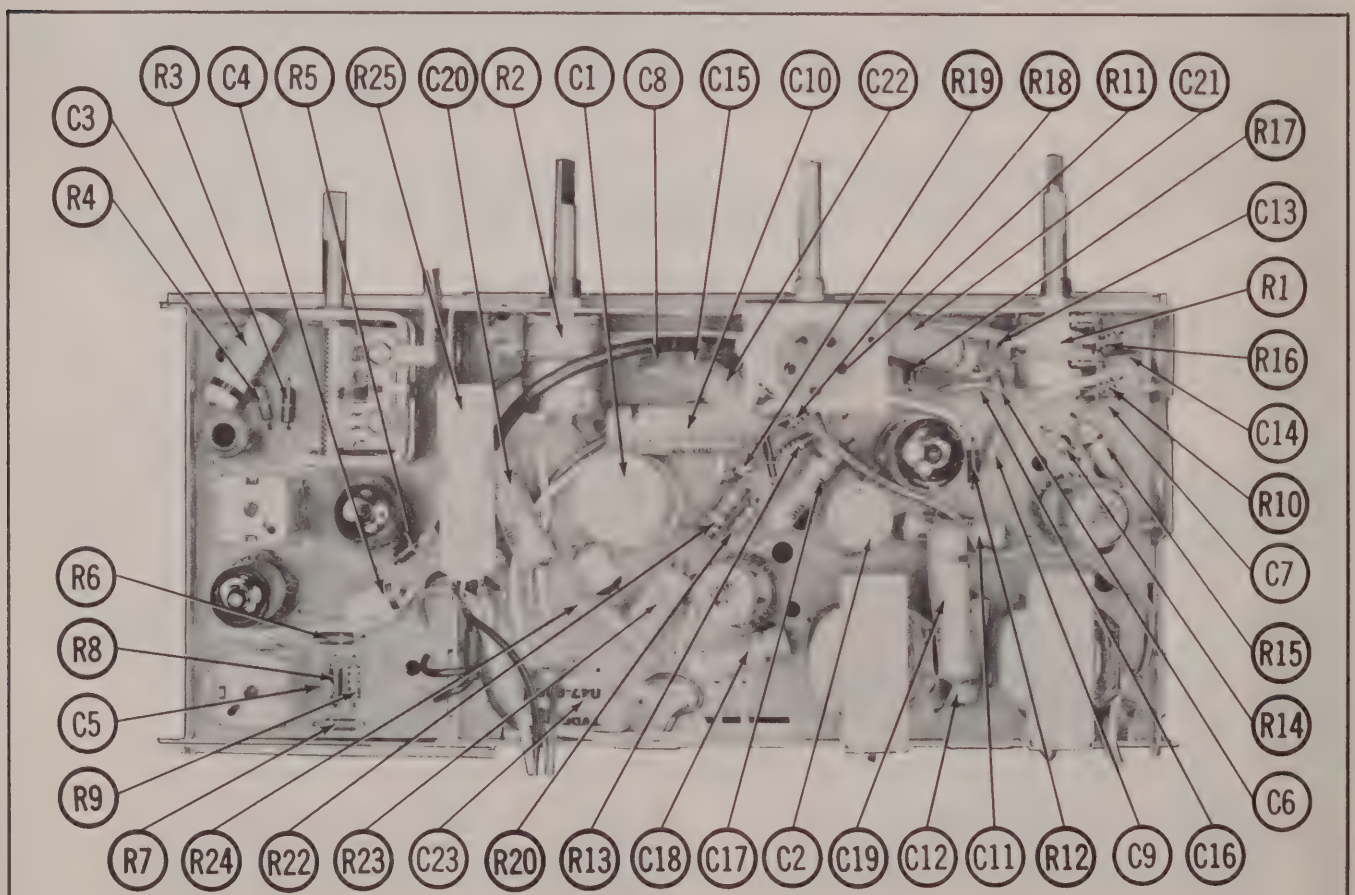
SET 455 FOLDER 7



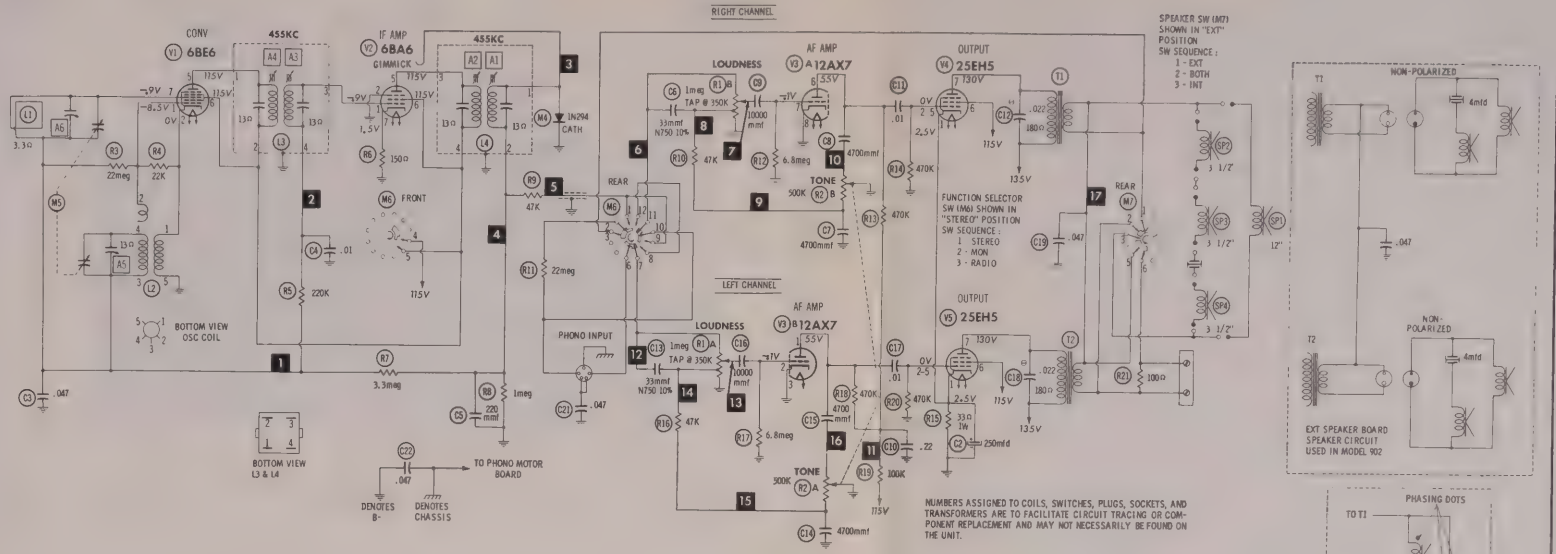
A Howard W. Sams CIRCUITRACE® Photo

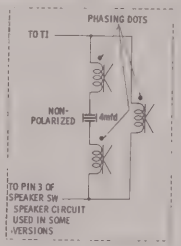
PRINTED BOARD

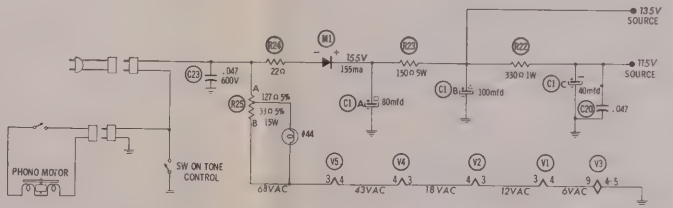
ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



PRINTED BOARD – CAPACITOR & RESISTOR IDENT.







RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BE6	22K	.7Ω	6Ω	3Ω	↑480Ω	↑480Ω	4meg		
V2	6BA6	4meg	0Ω	6Ω	9Ω	↑480Ω	↑480Ω	150Ω		
V3	12AX7	↑570K	6.8meg	0Ω	0Ω	0Ω	↑570K	6.8meg	0Ω	3Ω
V4	25EH5	33Ω	470K	9Ω	19Ω	470K	↑480Ω	↑330Ω		
V5	25EH5	33Ω	470K	19Ω	50Ω	470K	↑480Ω	↑330Ω		

↑ MEASURED FROM OUTPUT OF M1.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements.

❶ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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EMERSON MODELS 896B, 902 (Ch. 120455B, 120459B)

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	6BE6	
V2	IF Amplifier	6BA6	
V3	Right Channel AF Amp. - Left Channel AF Amp.	12AX7	
V4	Right Channel Output	25EH5	
V5	Left Channel Output	25EH5	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	EMERSON PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■80	150	925462					PCLS-3447.2*	
B	▲100	150							
C	40	150							
C2	250	15	925461	PRS15V250	BR2501	TC1502	TD-250-15	TVA-1161	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	EMERSON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C3	.047	400		921554	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C4	.01	400		921514	P488N-01	DD-103	CUB4S1	GEM-411	4TM-S1	
C5	220			928914	BPD-00022	DD-221	L10T22	B-322	5GA-T22	
C6	33		N750 10%	928894	N750-DI 33	DTN-33	C10Q33U	CN7-433	5TCU-Q33S 10%*	
C7	4700			928922	BPD-0047	DD-472	BYA10D47	B-247	5HK-D47	
C8	4700			928922	BPD-0047	DD-472	BYA10D47	B-247	5HK-D47	
C9	10000			928924	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C10	.22	200		923325	P288N-22		CUB2P22	GEM-2022	2TM-P22	
C11	.01	400		923514	P488N-01	DD-103	CUB4S1	GEM-411	4TM-S1	
C12	.022	400		924524P	P488N-022	DD-203	CUB4S22	GEM-4122	4TM-S22	①
C13	33		N750 10%	928894	N750-DI 33	DTN-33	C10V33U	CN7-433	5TCU-Q33S 10%*	
C14	4700			928922	BPD-0047	DD-472	BYA10D47	B-247	5HK-D47	
C15	4700			928922	BPD-0047	DD-472	BYA10D47	B-247	5HK-D47	
C16	10000			928924	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C17	.01	400		923514	P488N-01	DD-103	CUB4S1	GEM-411	4TM-S1	
C18	.022	400		924524P	P488N-022	DD-203	CUB4S22	GEM-4122	4TM-S22	①
C19	.047	400		923554	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C20	.047	400		923554	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C21	.047	400		923554	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C22	.047	400		923554	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C23	.047	600		922208	P1684CN-047		CUB16S5	GEM-1614	TR-15	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
Note 1. Chassis 120459B use Part #921724.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	EMERSON PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	390583				UE1749	Loudness, Left Channel, Tap @ 350K
B	1meg	½						Loudness, Right Channel, Tap @ 350K
R2A	500K	½	390582	B-59			■ UE3916-S	Tone, Left Channel
B	500K	½		SR-59				Tone, Right Channel
C	Switch			KR-1				Power On-Off

■ "STA-LOC" Equivalent: FB55A, RU55A, CS3500, US41.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	EMERSON PART No.	NOTES
R3	22meg		351532	
R4	22K		350812	
R5	220K		351052	
R6	150Ω		340292	
R7	3.3meg		351332	
R8	1meg		351212	
R9	47K		350892	
R10	47K		340892	
R11	22meg		341534	
R12	6.8meg		351412	
R13	470K		341132	
R14	470K		351132	

ITEM No.	RATING OHMS	RATING WATT	EMERSON PART No.	NOTES
R15	33Ω	1	370132	
R16	47K		340892	
R17	6.8meg		351412	
R18	470K		341132	
R19	100K		350972	
R20	470K		351132	
R21	100Ω		350252	
R22	330Ω	1	397137	
R23	150Ω	5	397132	
R24	22Ω		397133	Fuse Type
R25A	127Ω 5%	15	397134	
B	33Ω 5%			

COILS (RF-IF)

ITEM No.	USE	EMERSON PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Loop Ant.	700146						
L2	Osc. Coil	716119						
L3	Input IF Trans.	720259	16-6780	16-6780	BC-356	13-PC1	RF-4	
L4	Output IF Trans.	720259	16-6780	16-6780	BC-357	13-PC2	RF-4	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	EMERSON PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2300Ω	6-8Ω	734181	24S64 ①	A-2902 ①	AU-604 ①	A-3849 ①	24S64 ①		① Use original frame.
T2	2300Ω	6-8Ω	734181	24S64 ①	A-2902 ①	AU-604 ①	A-3849 ①	24S64 ①		

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	EMERSON PART No.	QUAM PART No.	
SP1	12"	PM	6-7Ω	180192 ①	12A31PA	① Model 896B
SP2	3½"	PM	2-3Ω	180191 ①		② Model 902, 2 used
SP3	3½"	PM	2-3Ω	180191 ①		
SP4	3½"	PM	2-3Ω	180191 ①		
	6"	PM		180193 ②		
	3½"	PM		180194 ②		

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	EMERSON PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.155A	817079 ①	CA102DA ①	SD-92 ①	K200 ①		① Silicon Type

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	EMERSON PART No.	ASTATIC PART No.		JENSEN PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M2	962326		13-T *			* Includes Cartridge

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	EMERSON PART No.	JENSEN PART No.	WALCO PART No.	
M3			* W-101ST † or * W-102S †	* Includes cartridge † Jewel

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		EMERSON PART No.	CBS PART No.	SYLVANIA PART No.	
M4	1N294	817061	1N54A	1N34A	AM Detector (Pigtail)

MISCELLANEOUS

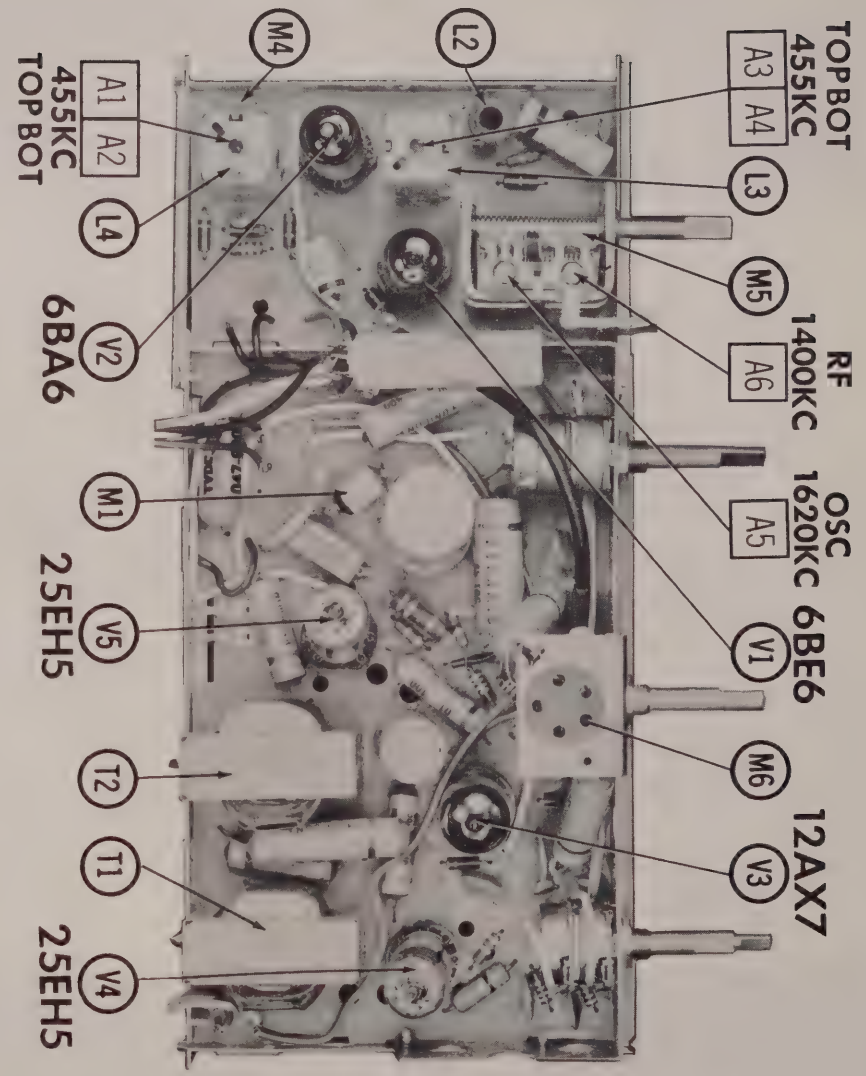
ITEM No.	PART NAME	EMERSON PART No.	NOTES
M5	Tuning Cap.	900188	2 Gang
M6	Switch	510145	Function (Stereo-Monaural-AM)
M7	Switch	510146	Speaker (Internal-Both-External)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	461082	Tuning, Model 896B
Knob	461092	Tuning, Model 902
Knob	461074	Volume (Outer), Model 896B
Knob	461093	Volume (Outer), Model 902
Knob	461075	Volume (Inner), Model 869B
Knob	461094	Volume (Inner), Model 902
Knob	461076	Tone, Off-On-Phono-Radio, Model 896B
Knob	461095	Tone, Off-On, Model 902
Knob	460935	Speaker Selector, Model 896B
Knob	461095	Function Selector, Model 902
Cabinet	140997	Brown & White, Model 902
Cabinet	140997A	Grey & White, Model 902

CHASSIS—TOP VIEW



WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No.	1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No.	8401
Phono Pick-up Arm Cable	Use BELDEN No.	8430 (Two Conductor - Twisted)

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

GENERAL ELECTRIC
MODELS MS-4000, MS-4010

GENERAL ELECTRIC
MODELS MS-4000, MS-4010

MODEL MS-4000

GENERAL ELECTRIC
MODELS MS-4000, MS-4010

TRADE NAME	General Electric Models MS-4000, MS-4010		
MANUFACTURER	General Electric Co., Specialty Electronic Components Dept., W. Genesee St., Auburn, N. Y.		
TYPE SET	AC Operated 12 Tube Stereo Amplifier		
POWER SUPPLY	105 – 125 Volts AC, 60 Cycles	RATING	120 Watts, 1.12 Amp. @117 Volts AC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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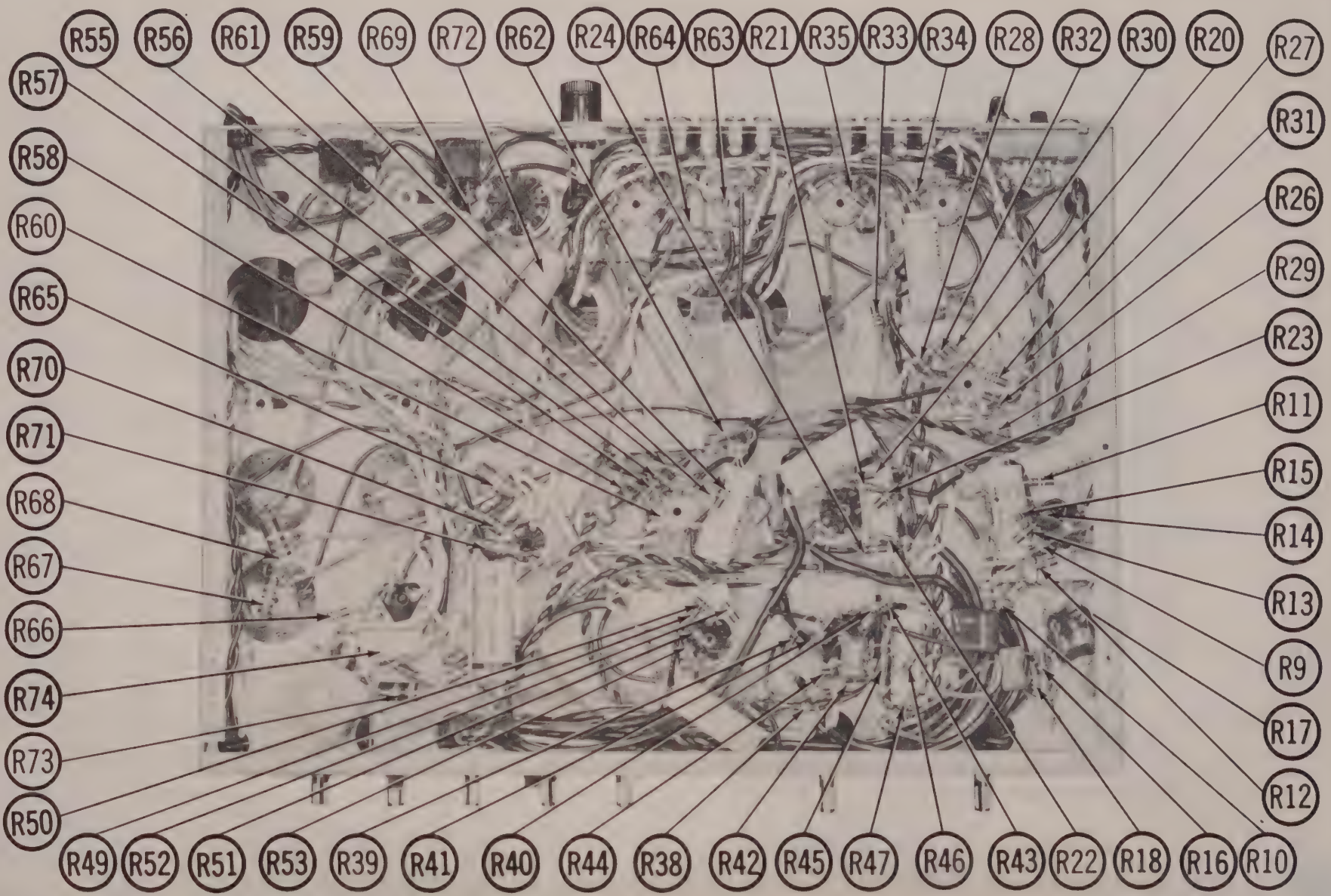
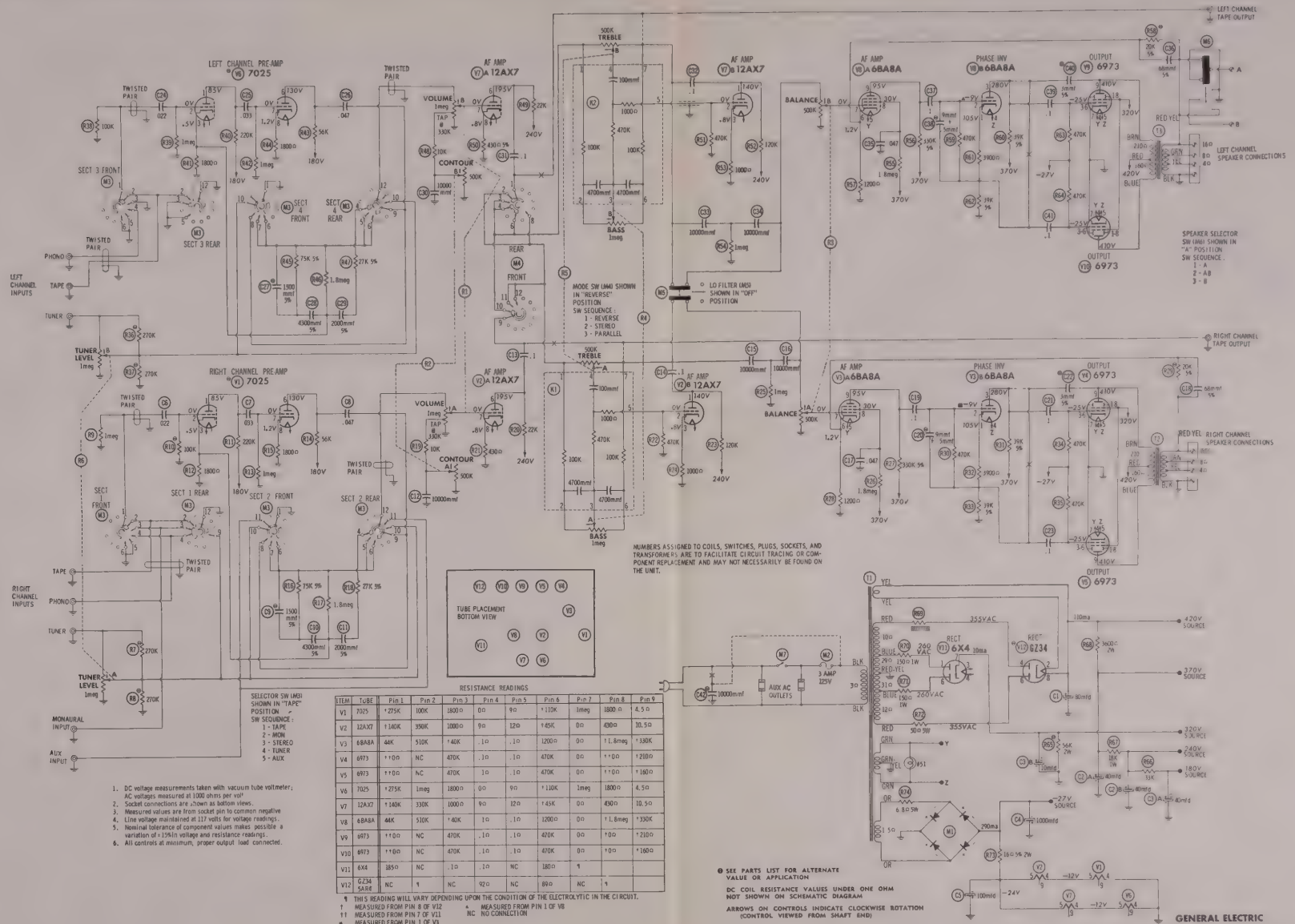
JV139

SET 455 FOLDER 8



CHASSIS BOTTOM VIEW – RESISTOR IDENT.



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	7025	†275K	100K	1800Ω	0Ω	9Ω	†110K	1meg	1800Ω	4.5Ω
V2	12AX7	†140K	350K	1000Ω	9Ω	12Ω	†45K	0Ω	430Ω	10.5Ω
V3	6BA8A	44K	510K	†40K	.1Ω	.1Ω	1200Ω	0Ω	†1.8meg	†330K
V4	6973	††0Ω	NC	470K	.1Ω	.1Ω	470K	0Ω	††0Ω	†210Ω
V5	6973	††0Ω	NC	470K	1Ω	.1Ω	470K	0Ω	††0Ω	†160Ω
V6	7025	†275K	1meg	1800Ω	0Ω	9Ω	†110K	1meg	1800Ω	4.5Ω
V7	12AX7	†140K	330K	1000Ω	9Ω	12Ω	†45K	0Ω	430Ω	10.5Ω
V8	6BA8A	44K	510K	†40K	1Ω	.1Ω	1200Ω	0Ω	†1.8meg	†330K
V9	6973	††0Ω	NC	470K	.1Ω	.1Ω	470K	0Ω	††0Ω	†210Ω
V10	6973	††0Ω	NC	470K	.1Ω	.1Ω	470K	0Ω	††0Ω	†160Ω
V11	6X4	185Ω	NC	.1Ω	.2Ω	NC	180Ω	¶		
V12	GZ34 5AR4	NC	¶	NC	92Ω	NC	89Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V12
†† MEASURED FROM PIN 7 OF V11
≠ MEASURED FROM PIN 1 OF V3
▲ MEASURED FROM PIN 1 OF V8
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

⊕ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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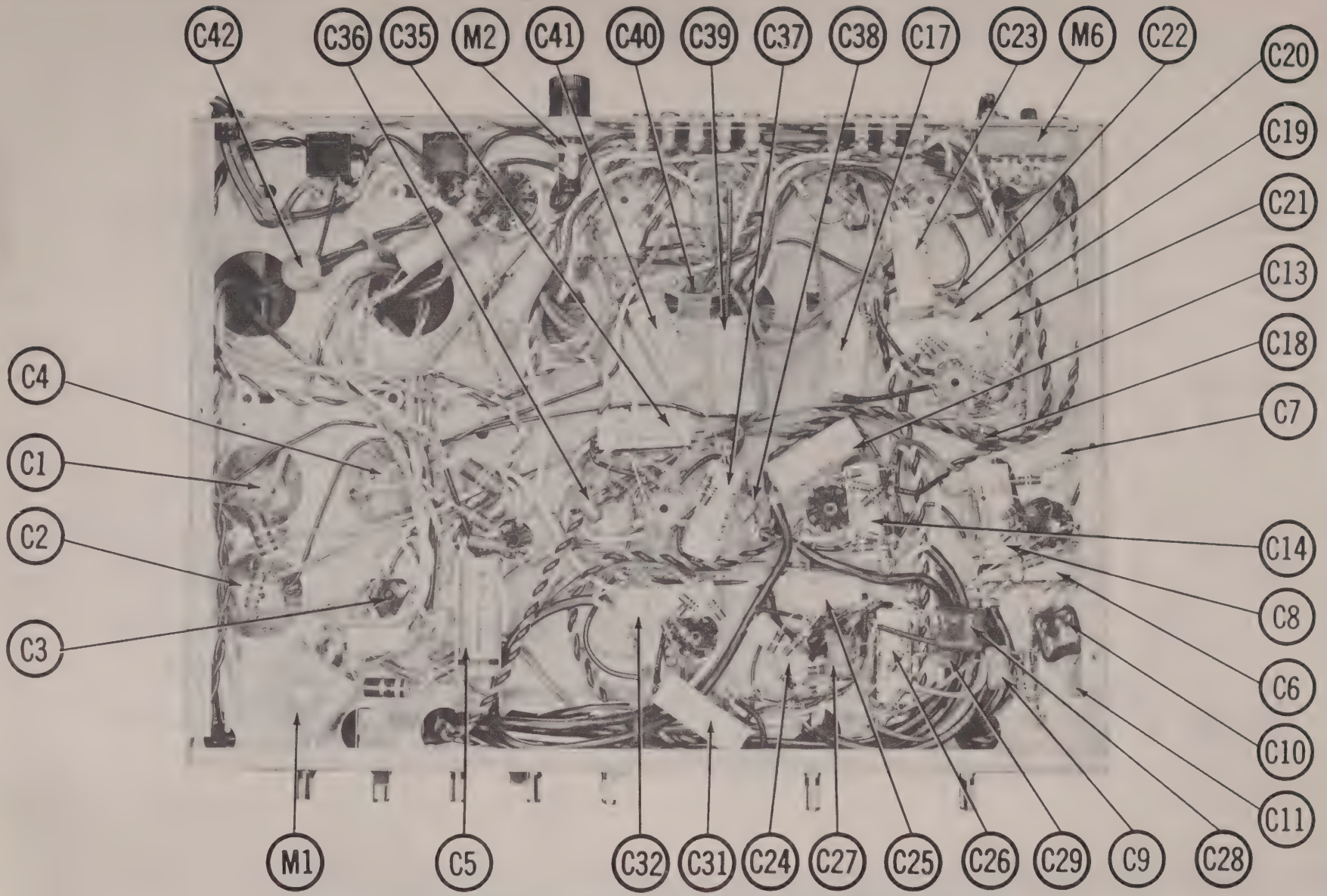
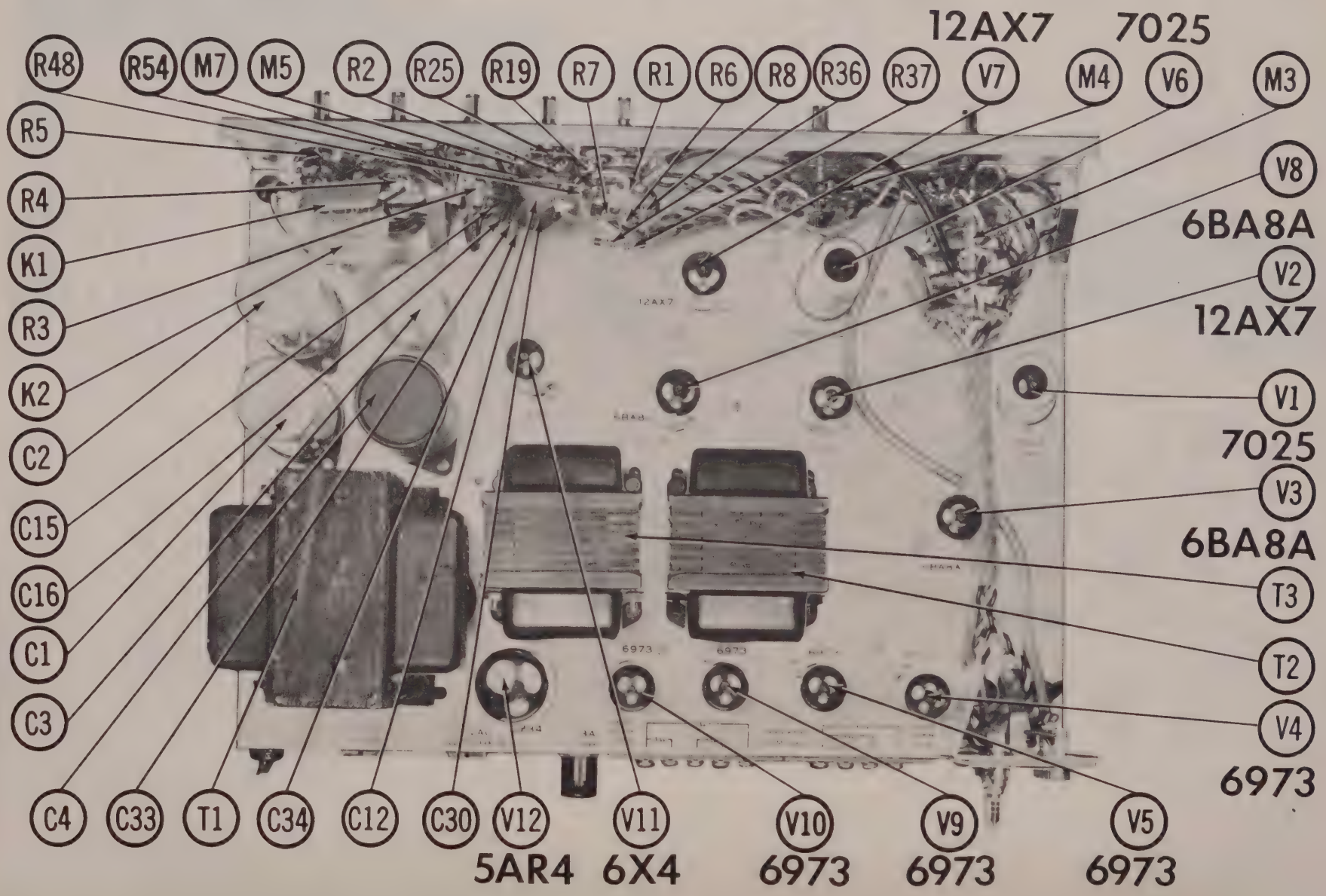
GENERAL ELECTRIC
MODELS MS-4000, MS-4010



CHASSIS BOTTOM VIEW — CAPACITOR & MISC. IDENT.



CHASSIS — TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Right Channel Preamp.	7025	12AX7 *
V2	Right Channel AF Amp.	12AX7	
V3	Right Channel AF Amp-Phase Inv.	6BA8A	
V4	Right Channel Output	6973	
V5	Right Channel Output	6973	
V6	Left Channel Preamp.	7025	12AX7*
V7	Left Channel AF Amp.	12AX7	
V8	Left Channel AF Amp-Phase Inv.	6BA8A	
V9	Left Channel Output	6973	
V10	Left Channel Output	6973	
V11	Rectifier	6X4	
V12	Rectifier	GZ34/5AR4	

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	G. E. PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	80	450	ECE-235	AFH1-55	A0510	FP149	TMS-60	TVL-1735	
C2A	▲40	400	ECE-236	AFH2-57	B0450	FP238	TMD-43	TVL-2764	
B	▲40	300							
C3A	■40	300	ECE-239	AFH3-30-35	B0410	FP333.5	TMD-42	TVLS-2657.7*	
B	▲10	400			BR1045		TD-10-450		
C4	1000	30	ECE-237	AFH1-14	A0170	WP059	TMS-16	TVL-1338	
C5	100	25	ECE-240	PRS25V100	BBR100-25	TC2501	TD-100-25	TVA-1207	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	G E PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C6	.022	200			P288N-022	DD-203	CUB4S22	GEM-4122	2TM-S22	
C7	.033	400			P488N-033		CUB4S33	GEM-4133	6TM-S33	
C8	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C9	1500		5%	ECG-018	1464-0015		1R5D15	MCE456	MS-215	①
C10	4300		5%	ECG-020	1464-0043		1R5D43		MS-243	
C11	2000		5%	ECG-016	1464-002		1R5D2	MCE457	MS-22	
C12	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C13	.1	400			P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C14	.1	400			P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C15	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C16	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C17	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C18	68		5%	ECG-021	1469-000068	TCZ-68	22R5Q68	CNO-468	MS-468	
C19	.1	400			P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C20	9		±.5mmf	ECG-022						②
C21	.1	400			P488N-1	D4-104	CUB4P1	GEM-401	4TM-P1	
C22	3		5%			D6-030			5TCCB-V3S 5%*	②
C23	.1	400			P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C24	.022	200			P288N-022	DD-203	CUB4S22	GEM-4122	2TM-S22	
C25	.033	400			P488N-033		CUB4S33	GEM-4133	6TM-S33	
C26	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C27	1500		5%	ECG-018	1464-0015		1R5D15	MCE456	MS-215	①
C28	4300		5%	ECG-020	1464-0043		1R5D43		MS-243	
C29	2000		5%	ECG-016	1464-002		1R5D2	MCE457	MS-22	
C30	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C31	.1	400			P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C32	.1	400			P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C33	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C34	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C35	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C36	68		5%	ECG-021	1469-000068	TCZ-68	22R5Q68	CNO-468	MS-468	
C37	.1	400			P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C38	9		±.5mmf	ECG-022						②
C39	.1	400			P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C40	3		5%			D6-030			5TCCB-V3S 5%*	②
C41	.1	400			P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C42	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	②

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
① Some versions may use 1100mmf 5% in this application. ② Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	G. E. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1meg	½	ERC-361	BT-71			† UE3968	Volume, Right Chan. Tap
B	1meg	½		STR-71				Volume, Left Chan. Tap
R2A	500K	½	ERC-362	B-60	AD47-500K-2	Q13-133	ǂ UE1402	Contour, Right Chan.
B	500K	½		SR-60	Not Req.	M13-133		Contour, Left Chan.
C	Shaft			Not Req.	KSS-3	Not Req.		
R3A	500K	½	ERC-363	B-61		Q17-133	†† UE3969	Balance, Right Chan.
B	500K	½		SR-60		M13-133		Balance, Left Chan.
R4A	1meg	½	ERC-364	B-69	AD47-1meg-S	Q11-137		Bass, Right Chan.
B	1meg	½		SR-69	Not Req.	M11-137	ǂǂ UE1706	Bass, Left Chan.
C	Shaft			Not Req.	KSS-3	Not Req.		
R5A	500K	½	ERC-365	B-59		Q11-133	¶ UE1295	Treble, Right Chan.
B	500K	½		SR-59		M11-133		Treble, Left Chan.
R6A	1meg	½	ERC-366					Tuner Level, Right Chan.
B	1meg	½						Tuner Level, Left Chan.

ǂǂ "STA-LOC" equivalent: FA16L, RU16L, CS3500
¶ "STA-LOC" equivalent: FA55L, RU55L, CS3500
† "STA-LOC" equivalent: FA16T35, RU16T35, CS3500
ǂ "STA-LOC" equivalent: FA55A, RU55A, CS3500
†† "STA-LOC" equivalent: FA55R, RU55A, CS3500

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		G. E. PART No.	NOTES
	OHMS	WATT		
R7	270K			Note 1
R8	270K			Note 1
R9	1meg			
R10	100K			Note 4
R11	220K			
R12	1800Ω			
R13	1meg			
R14	56K			
R15	1800Ω			
R16	75K 5%			
R17	1.8meg			
R18	27K 5%			
R19	10K			
R20	22K			
R21	430Ω			
R22	470K			
R23	120K			
R24	1000Ω			
R25	1meg			
R26	1.8meg			
R27	330K 5%			
R28	1200Ω			
R29	20K 5%			Note 2
R30	470K			
R31	39K 5%			
R32	3900Ω			
R33	39K 5%			
R34	470K			
R35	470K			
R36	270K			Note 1
R37	270K			Note 1
R38	100K			
R39	1meg			
R40	220K			

ITEM No.	RATING		G. E. PART No.	NOTES
	OHMS	WATT		
R41	1800Ω			
R42	1meg			
R43	56K			
R44	1800Ω			
R45	75K 5%			
R46	1.8meg			
R47	27K 5%			
R48	10K			
R49	22K			
R50	430Ω 5%			
R51	470K			
R52	120K			
R53	1000Ω			
R54	1meg			
R55	1.8meg			
R56	330K 5%			
R57	1200Ω			
R58	20K 5%			Note 2
R59	470K			
R60	39K 5%			
R61	3900Ω			
R62	39K 5%			
R63	470K			
R64	470K			
R65	56K	2		Note 2
R66	33K			
R67	18K	1		
R68	3600Ω	2		
R69	50Ω	5	ERW-145	
R70	150Ω	1		
R71	150Ω	1		
R72	50Ω	5	ERW-145	
R73	16Ω 5%	2		
R74	6.8Ω	5		

Note 1. Not used in some versions.
Note 2. Some versions may use 13K 5% in this application.
Note 3. Some versions may use a 1meg in this application.

PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	G. E. PART No.	REPLACEMENT DATA
K1	Tone Comp.	100mmf, 4700mmf, 4700mmf, 1000Ω, 100K, 100K, 470K	EEK-010	Centralab PC-190 Sprague TC-1
K2	Tone Comp.	100mmf, 4700mmf, 4700mmf, 1000Ω, 100K, 100K, 470K	EEK-010	Centralab PC-190 Sprague TC-1

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	G. E. PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ 1.12A	710 VCT @ .110A Tap @ 520 VCT @ .010A	5V @ 1.9A	ETP-334						
	SEC. 3	SEC. 4	SEC. 5							
	6.3 VCT @ 3.8A	27V @ .350A								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	G.E. PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	7000Ω CT	16Ω Taps @ 8Ω, 4Ω	ETO-186	22S68 ①			A-3304 ①	22S68 ①	S-31A ①	① Drill new mounting holes
T3	7000Ω CT	16Ω Taps @ 8Ω, 4Ω	ETO-186	22S68 ①			A-3304 ①	22S68 ①	S-31A ①	

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	G. E. PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.290A	EER-013	1016 ①		304B ①		①Selenium

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			G. E. PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	MDX	3A 125V		EJW-004	313003. (3A 125V)	342012	MDX 3	HKP

MISCELLANEOUS

ITEM No.	PART NAME	G. E. PART No.	NOTES
M3	Switch	ESW-116	Function
M4	Switch	ESW-117	Mode
M5	Switch	ESW-118	Lo Filter (SPDT, Slide Type)
M6	Switch	ESW-119	Speaker Phase (SPDT, Slide Type)
M7	Switch	ESW-120	Power Off-On (SPDT, Slide Type)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	EDK-552	Large Black, With Half Blue Line
Knob	EDK-553	Large Black, With Full Blue Line
Knob	EDK-554	Small Black
Cabinet	EAV-1009	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT* Folder

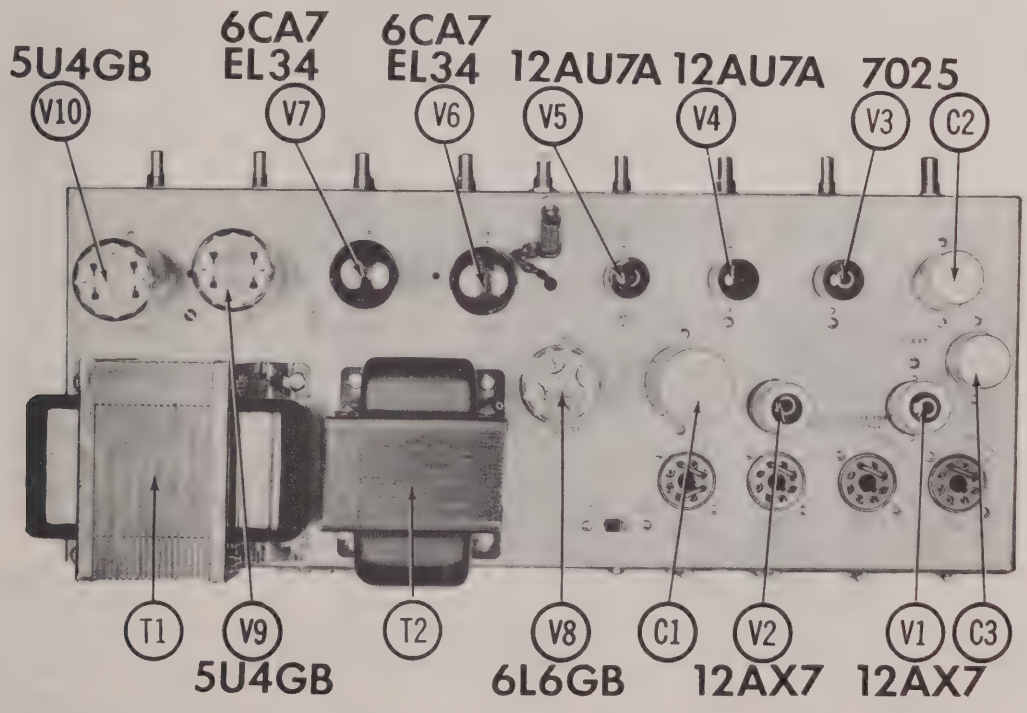
EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

GROMMES
MODEL G-75

GROMMES
MODEL G-75

TRADE NAME	Grommes Model G-75		
MANUFACTURER	Precision Electronics, Inc., 9101 King Ave., Franklin Park, Illinois		
TYPE SET	AC Operated 10 Tube Audio Amplifier		
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles	RATING	120 Watts, 1.2 Amp. @117 Volts AC (No Signal Input) 180 Watts, 1.8 Amp. @117 Volts AC (Full Rated Output)

GROMMES
MODEL G-75



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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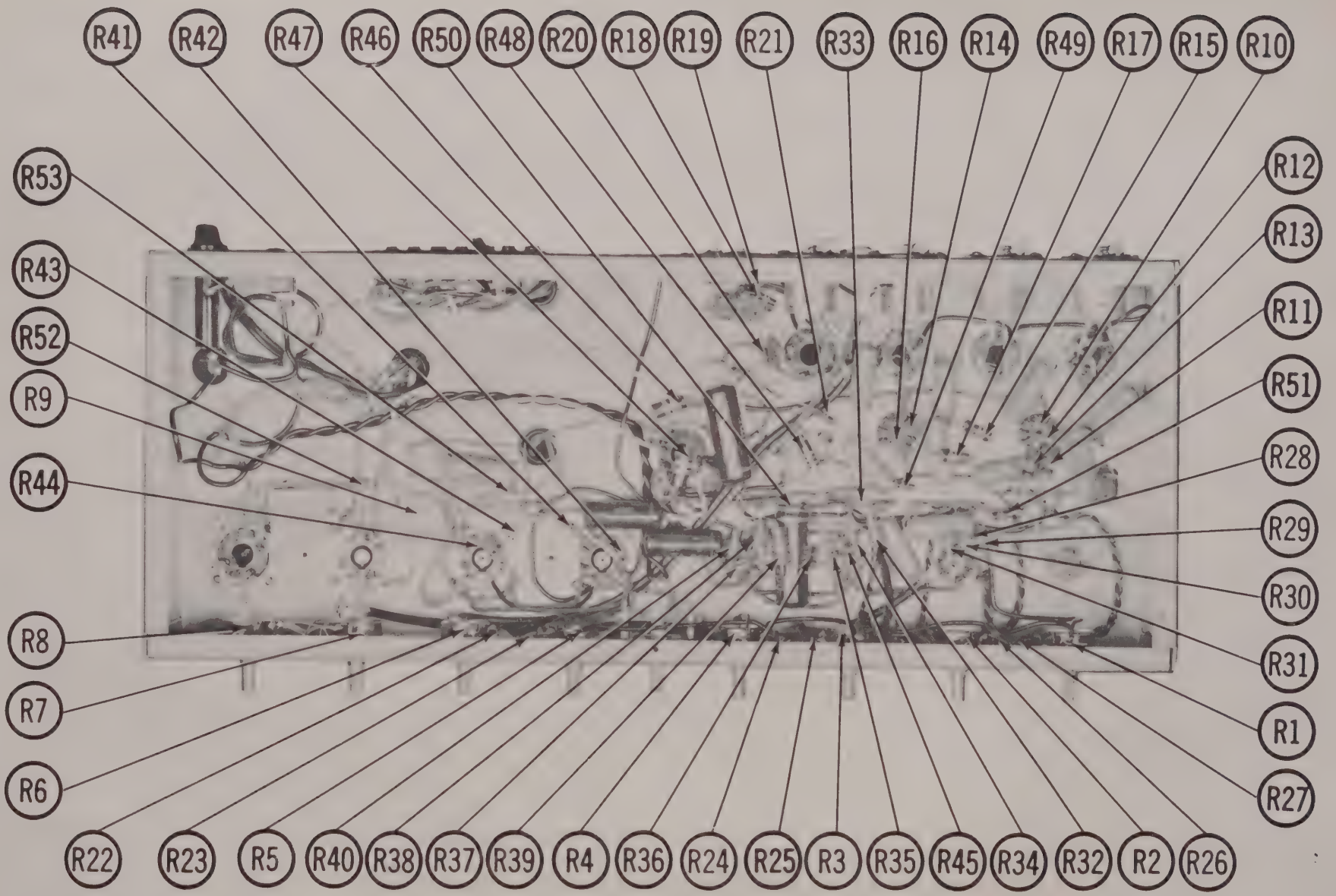
JX378

SET 455 FOLDER 9



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Mic 1 & 2 Preamplifier	12AX7	
V2	Mic 3 & 4 Preamplifier	12AX7	
V3	AF Amplifier	7025	12AX7 *
V4	AF Amplifier	12AU7A	
V5	AF Amp-Phase Inverter	12AU7A	

ITEM No.	USE	TYPE	NOTES
V6	Output	EL34/6CA7	
V7	Output	EL34/6CA7	
V8	Regulator	6L6GB	
V9	Rectifier	5U4GB	
V10	Rectifier	5U4GB	

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	GROMMES PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	▬40	500		AFH3-50-05	C0372	FP396.1	TMQ-123	TVL-3842	
B	■20	500							
C	▲20	500							
C2A	■10	350		AFH2-47	B0370	FP231	TMD-47	TVL-2750	
B	▲10	350							
C3A	■10	350		AFH2-47	B0370	FP231	TMD-47	TVL-2750	
B	▲10	350							
C4	50	50		PRS50V50	BR505	TC39	TD-50-50	TVA-1308	

FIXED CAPACITORS

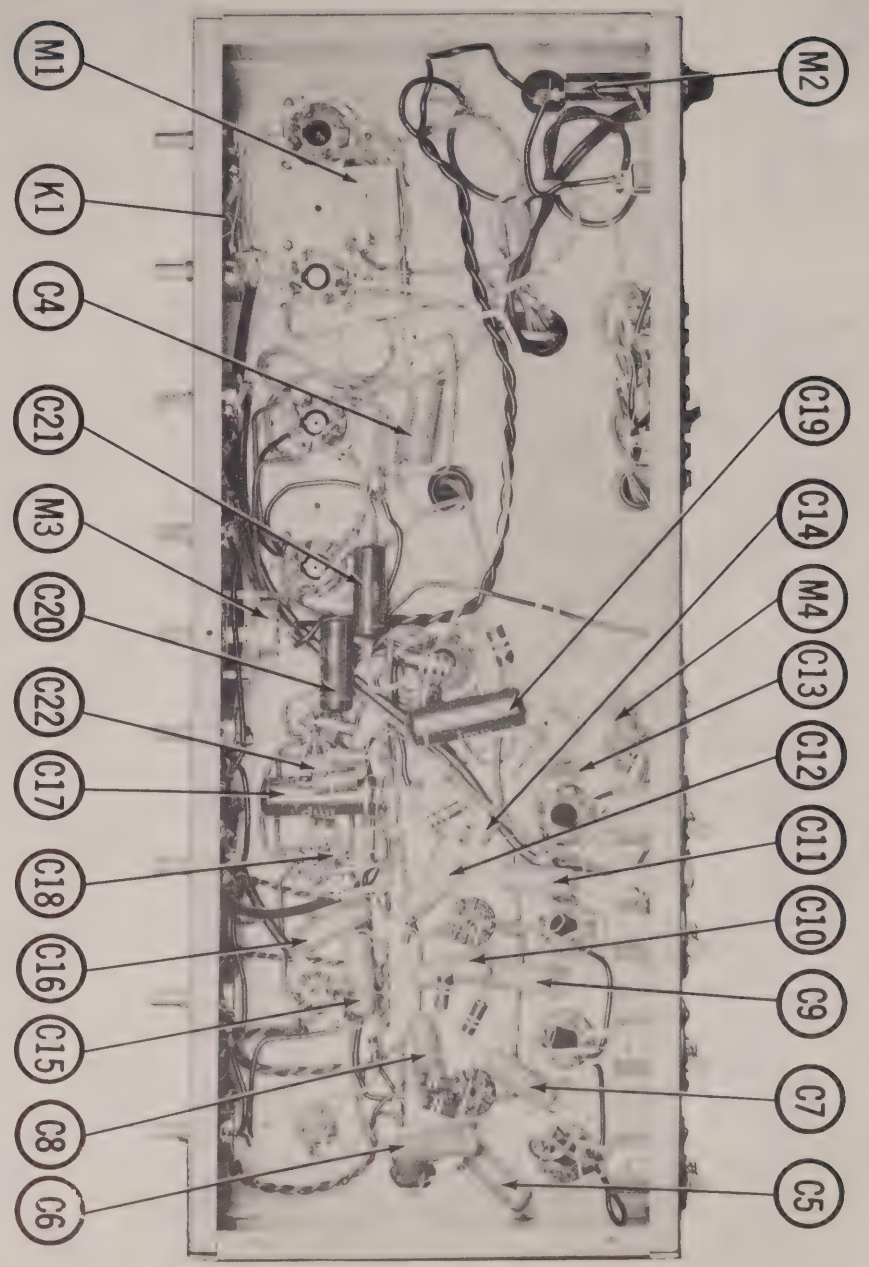
Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	GROMMES PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C6	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C7	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C8	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C9	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C10	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C11	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C12	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C13	3000				BPD-003	DD-302	BYA10D3	UC-523	5HK-D3	
C14	800				BPD-0008	DD-801	LI0T8	B-382	5GA-T8	
C15	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C16	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C17	.47	200			P288N-47		CUB2P47	GEM-2047	2TM-P47	
C18	20				SI 20	D6-200	LI0Q2	ZT-542	5GA-Q2	
C19	.47	200			P288N-47		CUB2P47	GEM-2047	4TM-P47	
C20	.1	400			P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C21	.1	400			P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C22	20				SI 20	D6-200	LI0Q2	ZT-542	5GA-Q2	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	GROMMES PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	GVC-500K	B-60	A47-500K-Z	Q13-133	U48	Mic 1
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R2A	500K	½	GVC-500K	B-60	A47-500K-Z	Q13-133	U48	Mic 2
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R3A	500K	½	GVC-500K	B-60	A47-500K-Z	Q13-133	U48	Mic 3
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R4A	500K	½	GVC-500K	B-60	A47-500K-Z	Q13-133	U48	Mic 4
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R5A	500K	½	GVC-500K	B-60	A47-500K-Z	Q13-133	U48	Phono 1
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R6A	500K	½	GVC-500K	B-60	A47-500K-Z	Q13-133	U48	Phono 2
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R7A	1meg	½	GTC-1M	B-69	A47-1meg-S	Q11-137	U54	Bass
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R8A	1meg	½	GTC-1M	B-69	A47-1meg-S	Q11-137	U54	Treble
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R9A	10K	½	CLU-10K	B-14	A47-10K-S	Q11-116	U20	Bias
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	

CHASSIS BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	GROMMES PART No.	NOTES
R10	3.3meg			
R11	100K	1		
R12	3.3meg			
R13	100K	1		
R14	3.3meg			
R15	100K	1		
R16	3.3meg			
R17	100K	1		
R18	10K			
R19	47K			
R20	3.3meg			
R21	100K			
R22	470K			
R23	470K			
R24	470K			
R25	470K			
R26	470K			
R27	470K			
R28	1meg			
R29	100K			
R30	100K			
R31	470K			
R32	100K			
R33	470K			
R34	1000Ω			
R35	100K			
R36	1meg			
R37	1meg			
R38	47K	1		
R39	22K	2		
R40	56K	1		
R41	100K			
R42	1000Ω			
R43	100K			
R44	1000Ω			
R45	100K			
R46	100K	2		
R47	220K	2		
R48	4700Ω	1		
R49	10K			
R50	47K			
R51	10K			
R52	18K			
R53	22K			

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	GROMMES PART No.	REPLACEMENT DATA
K1	Tone Compensation	470mmf, 3000mmf, 3000mmf, 10K, 68K, 68K, 68K		

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA GROMMES PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ⓐ 1.2A	770 VCT ⓐ .100A* Tap ⓐ 100V ⓐ .001A	5V ⓐ 6A	TP75UA						
	SEC. 3									
	6.3 VCT ⓐ 5.6A									

* .220A At Rated Output.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA GROMMES PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	3500Ω CT	250Ω Tap ⓐ 100Ω (70V), 62Ω, 16Ω, 8Ω	T050							

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA GROMMES PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	NOTES
M1	.001A		1234AH	T065	10	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA GROMMES PART No. FUSE	GROMMES PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M2	3AG	5A 250V			312005. (3AG 5A 250V)	342001	MTH5	HKP

MISCELLANEOUS

ITEM No.	PART NAME	GROMMES PART No.	NOTES
M3	Switch		Power Off-On
M4	Switch		Mike-Mag. Phono. (DPDT, Slide Type)

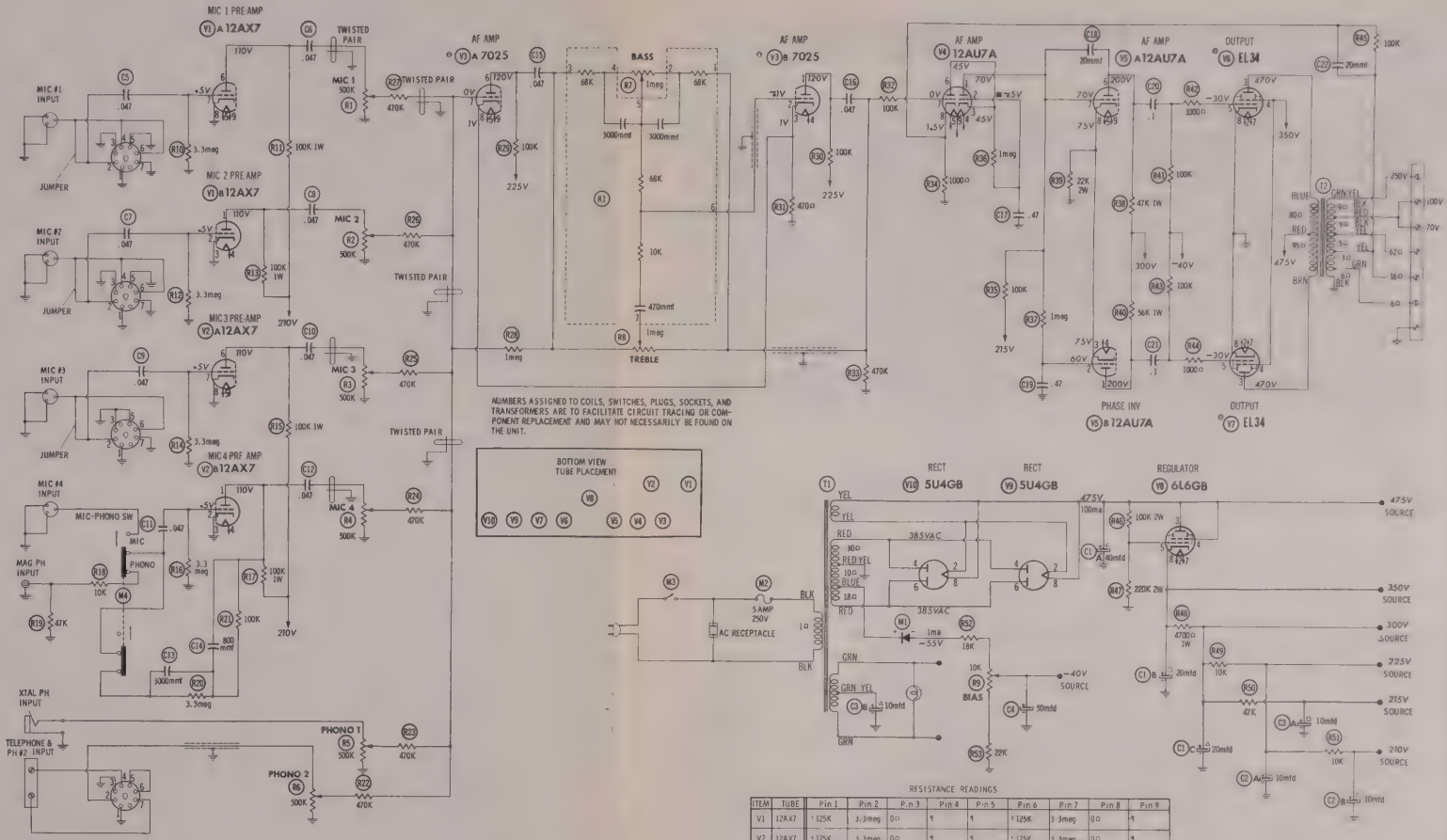
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

BOTTOM VIEW TUBE PLACEMENT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†125K	3.3meg	0Ω	¶	¶	†125K	3.3meg	0Ω	¶
V2	12AX7	†125K	3.3meg	0Ω	¶	¶	†125K	3.3meg	0Ω	¶
V3	7025	†115K	500K	470Ω	¶	¶	†115K	80K	470Ω	¶
V4	12AU7A	†150K	INF	INF	¶	¶	INF	450K	1000Ω	¶
V5	12AU7A	†60K	††1.1meg	22K	¶	¶	†50K	†150K	22K	¶
V6	EL34 6CA7	0Ω	¶	††80Ω	*0Ω	120K	TP	¶	0Ω	
V7	EL34 6CA7	0Ω	¶	††95Ω	*0Ω	120K	TP	¶	0Ω	
V8	6L6GB	TP	¶	††0Ω	††0Ω	220K	NC	¶	¶	
V9	5U4GB	NC	¶	NC	30Ω	TP	28Ω	NC	¶	
V10	5U4GB	NC	¶	NC	30Ω	NC	28Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V8.
†† MEASURED FROM PIN 8 OF V10.
* MEASURED FROM PIN 3 OF V4.
NC NO CONNECTION
TP TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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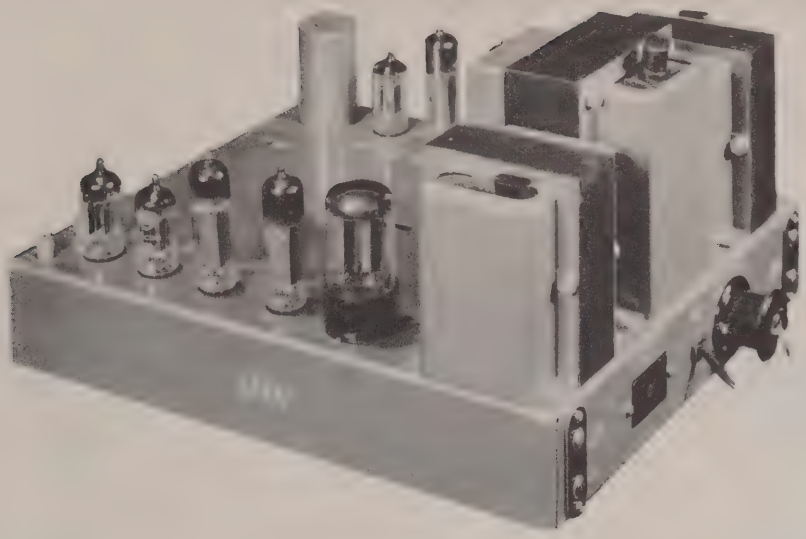
GROMMES
MODEL G-75

PHOTOFACT* Folder

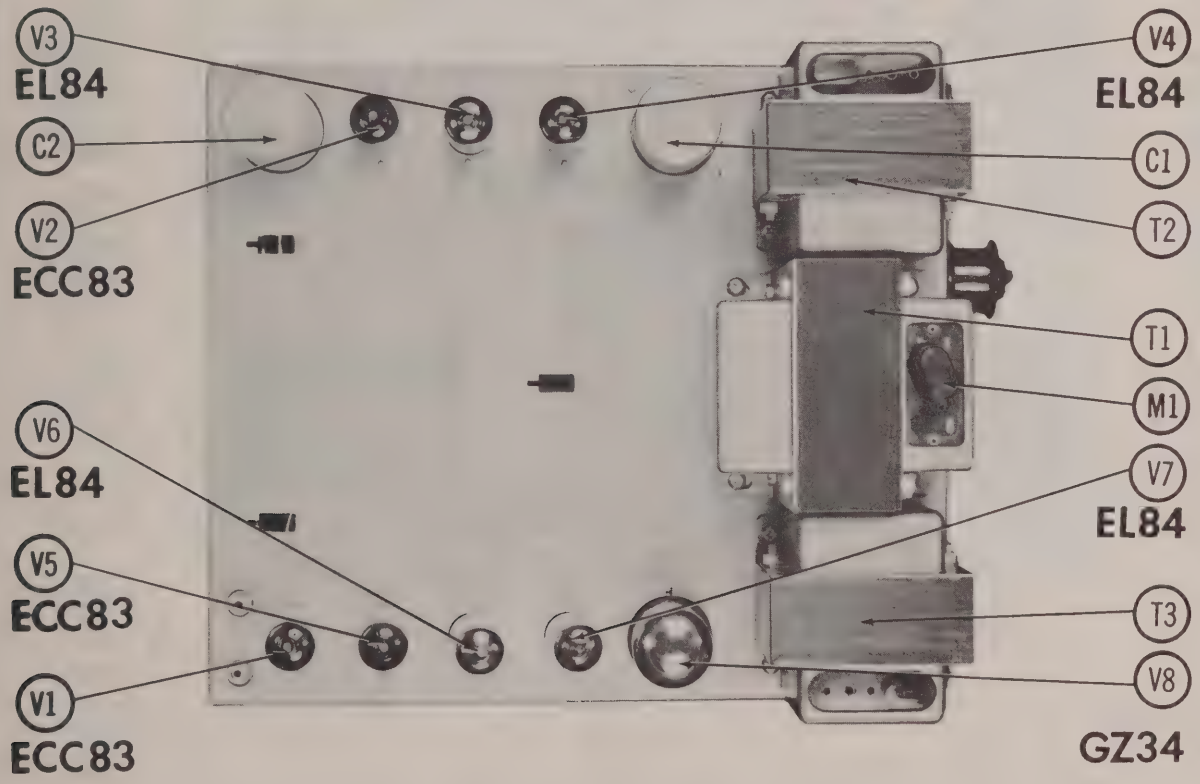
EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

Howard W. Sams

LEAK MODEL
Stereo 20



TRADE NAME	Leak Model Stereo 20
IMPORTER	British Industries Corp., 80 Shore Road, Port Washington, N. Y.
TYPE SET	AC Operated 8 Tube Stereo Amplifier
POWER SUPPLY	110/117/124 Volts AC, 60 Cycles RATING 115 Watts, 1.1 Amp. @117 Volts AC



LEAK MODEL
Stereo 20

LEAK MODEL
Stereo 20

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of JV212

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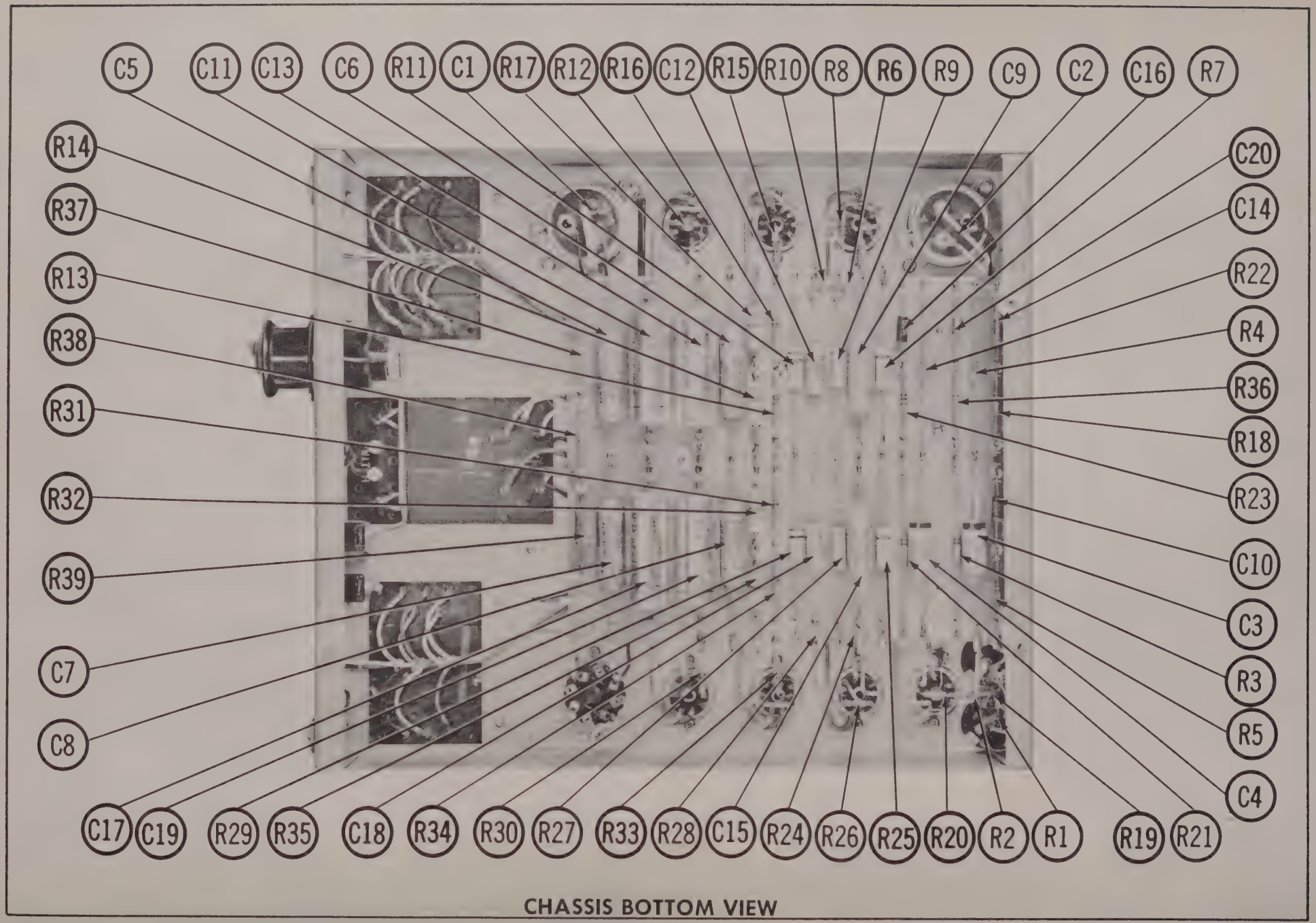
SET 455 FOLDER 10



CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Right Channel AF Amp. - Left Channel AF Amp.	ECC83	①
V2	Right Channel AF Amp. - Right Channel Phase Inv.	ECC83	①
V3	Right Channel Output	EL84	②
V4	Right Channel Output	EL84	②
V5	Left Channel AF Amp. - Left Channel Phase Inv.	ECC83	①
V6	Left Channel Output	EL84	②
V7	Left Channel Output	EL84	②
V8	Rectifier	GZ34	③

① Alternate 12AX7, B339
② Alternate 6BQ5, N709
③ Alternate 5AR4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	LEAK PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	32	450		AFH2-54	B0430	FP237	TMD-52	TVL-2628	
B	32	450							
C2A	32	450		AFH2-54	B0430	FP237	TMD-52	TVL-2628	
B	32	450							
C3	50	12		SRE12V50	BBR50-25	TC29	TD-50-25	TVA-1206	
C4	50	12		SRE12V50	BBR50-25	TC29	TD-50-25	TVA-1206	
C5	50	25		PRS25V50	BBR50-25	TC29	TD-50-25	TVA-1206	
C6	50	25		PRS25V50	BBR50-25	TC29	TD-50-25	TVA-1206	
C7	50	25		PRS25V50	BBR50-25	TC29	TD-50-25	TVA-1206	
C8	50	25		PRS25V50	BBR50-25	TC29	TD-50-25	TVA-1206	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	LEAK PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C9	.1	350			P488N-1	DF-104	CUB4P1	GEM-411	4TM-P1	
C10	.001	400			P488N-001	D6-102	CUB6D1	GEM-421	4TM-D1	
C11	.25	350			P488N-25		CUB4P25	GEM-4025	4TM-P25	
C12	.02	350			P488N-02	DD-203	CUB4S2	GEM-412	4TM-S2	
C13	.25	350			P488N-25		CUB4P25	GEM-4025	4TM-P25	
C14	.0002	350	5%			TCZ-200	22R5T2	MCE237	MS-32	
C15	.1	350			P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C16	.001	400			P488N-001	D6-102	CUB6D1	GEM-421	4TM-D1	
C17	.25	350			P488N-25		CUB4P25	GEM-4025	4TM-P25	
C18	.02	350			P488N-02	DD-203	CUB4S2	GEM-412	4TM-S2	
C19	.25	350			P488N-25		CUB4P25	GEM-4025	4TM-P25	
C20	.0002	350	5%			TCZ-200	22R5T2	MCE237	MS-32	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		LEAK PART No.	NOTES
	OHMS	WATT		
R1	1meg			
R2	22K			
R3	100K			
R4	2200Ω			
R5	100Ω 5%			
R6	3.3meg			
R7	91K	1		
R8	1000Ω			
R9	22K	1		
R10	3.3meg			
R11	100K	1		
R12	10K			
R13	1meg			
R14	270Ω 5%	1		
R15	10K			
R16	1meg			
R17	270Ω 5%	1		
R18	12K 5%			
R19	1meg			
R20	22K			
R21	100K			
R22	2200Ω			
R23	100Ω 5%			
R24	3.3meg			

RESISTORS (cont)

ITEM No.	RATING		LEAK PART No.	NOTES
	OHMS	WATT		
R25	91K	1		
R26	1000Ω			
R27	22K	1		
R28	3.3meg			
R29	100K	1		
R30	10K			
R31	1meg			
R32	270Ω 5%	1		
R33	10K			
R34	1meg			
R35	270Ω 5%	1		
R36	12K 5%			
R37	47K			
R38	4700Ω			
R39	100Ω 5%	1		

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	LEAK PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	124V Tap ⓐ117V ⓐ 1.1A Tap ⓐ 110V	620 VCT ⓐ.170A	5V ⓐ 3A	8189						
	SEC. 3	SEC. 4	SEC. 5							
	6.3 VCT ⓐ4.5A									

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	LEAK PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	8500Ω CT	16Ω	3921						S-142A①	① Drill new mounting holes.
	Screen Taps ⓐ	Taps ⓐ 8Ω								
	2800Ω CT	4Ω								
T3	8500Ω CT	16Ω	3921						S-142A①	
	Screen Taps ⓐ	Taps ⓐ 8Ω								
	2800Ω CT	4Ω								

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			LEAK PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	①	3A						

① Plug in fuse & voltage selector, selects 110-117 or 124 V input to primary.

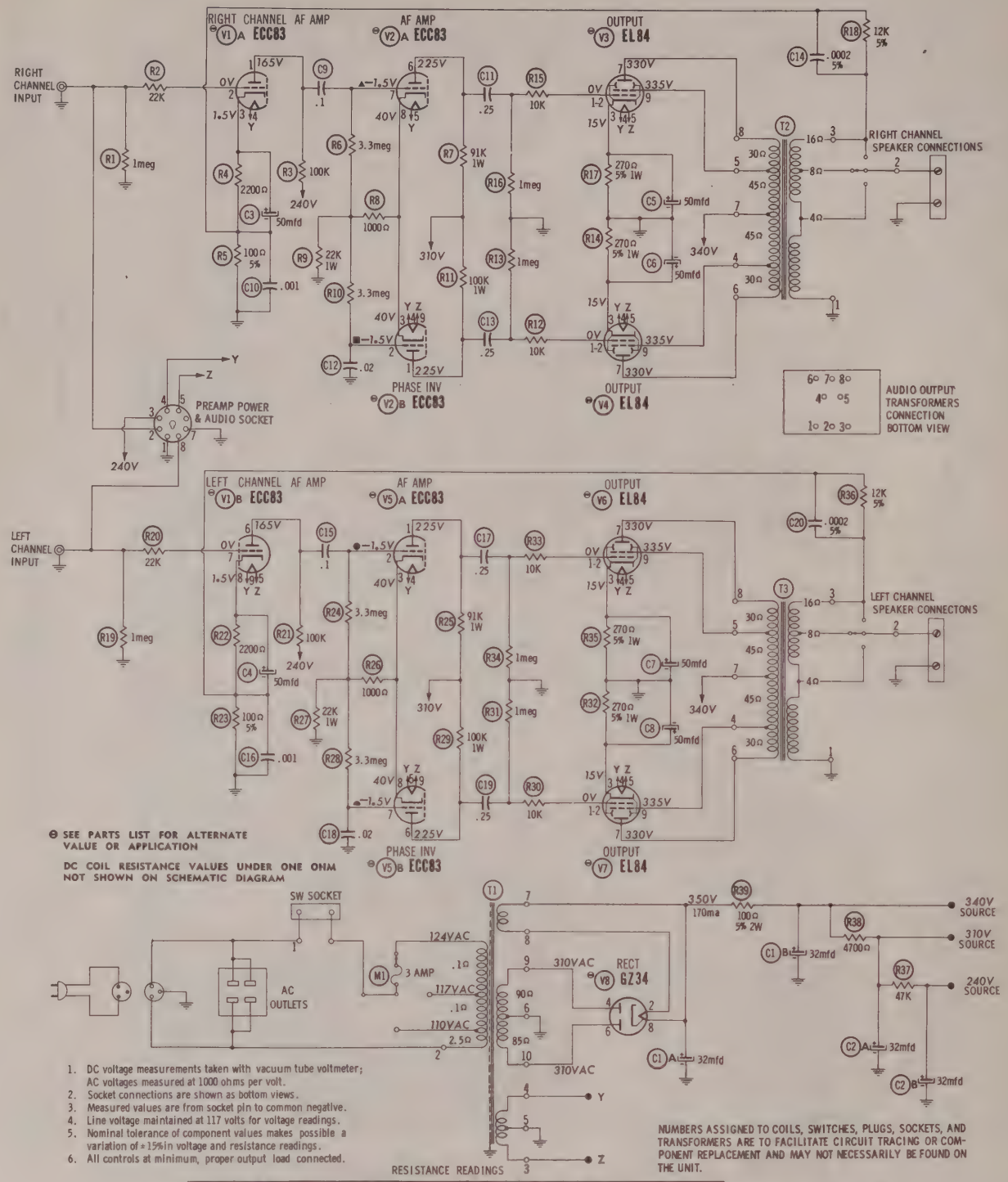
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

FOLDER 10

LEAK MODEL Stereo 20



⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC83	†150K	1meg	2300Ω	.1Ω	.1Ω	†150K	1meg	2300Ω	.1Ω
V2	ECC83	†100K	3.3meg	23K	.1Ω	.1Ω	†95K	3.3meg	23K	.1Ω
V3	EL84	1meg	1meg	270Ω	.1Ω	.1Ω	NC	†175Ω	NC	†145Ω
V4	EL84	1meg	1meg	270Ω	.1Ω	.1Ω	NC	†175Ω	NC	†145Ω
V5	ECC83	†95K	3.3meg	23K	.1Ω	.1Ω	†100K	3.3meg	23K	.1Ω
V6	EL84	1meg	1meg	270Ω	.1Ω	.1Ω	NC	†175Ω	NC	†145Ω
V7	EL84	1meg	1meg	270Ω	.1Ω	.1Ω	NC	†175Ω	NC	†145Ω
V8	GZ34	NC	¶	NC	90Ω	NC	85Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V8. ● MEASURED FROM PIN 3 OF V5.
■ MEASURED FROM PIN 3 OF V2 ▬ MEASURED FROM PIN 8 OF V5.
▲ MEASURED FROM PIN 8 OF V2 NC NO CONNECTION

POWER TRANSFORMER CONNECTIONS BOTTOM VIEW

TUBE PLACEMENT BOTTOM VIEW

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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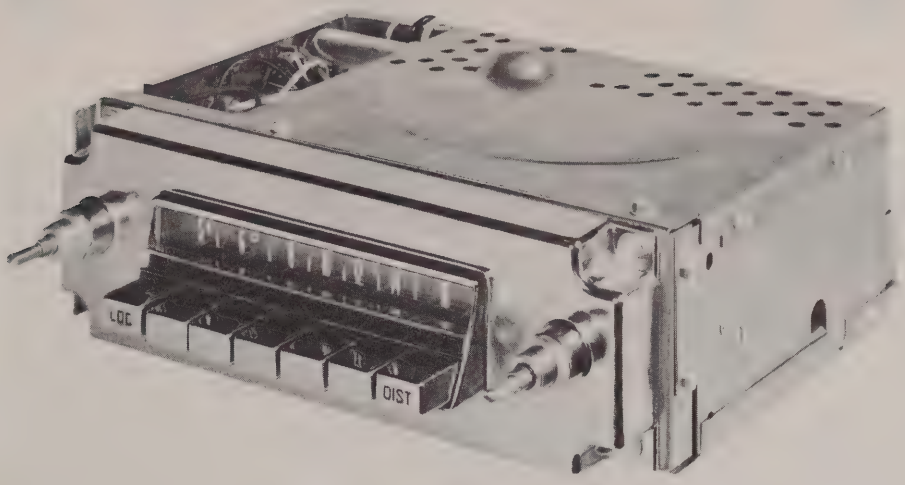
LEAK MODEL
Stereo 20

PHOTOFACT* Folder with CIRCUITRACE*

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

MOPAR
MODEL 929

MOPAR
MODEL 929



TRADE NAME	Mopar Model 929 (C-5909) For 1959 Imperial MY1 Automobiles
MANUFACTURER	Philco Corp., Tioga & "C" Streets, Philadelphia, Pa.
TYPE SET	Battery Operated 5 Tube Custom Built AM Automobile Receiver With Transistorized Output
POWER SUPPLY	12 Volt Storage Battery
RATING	1.6A@12.6 Volts DC
TUNING RANGE—BROADCAST	535KC — 1610KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:
A1, A2..... GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545
A3, A4..... GENERAL CEMENT #5097, 8727
WALSCO #2515
A5, A6..... GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05mfd	High side to pin 7 (grid) of converter. Low side to chassis.	262.5KC (Unmod.)	High Freq. end stop	DC probe to point Ⓐ. Common to chassis.	A1, A2, A3	Adjust for maximum deflection.
2.	"	"	"	"	"	A4	Adjust for MINIMUM deflection.
3.	40mmf	High side to antenna receptacle. Low side to chassis.	1610KC (400~ Mod.)	"	Output meter across voice coil.	A5, A6	Adjust for maximum output.
4.	"	"	1000KC	1000KC	"	A7	"

With radio installed in car and antenna fully extended, tune in a weak station near 1000KC and adjust A7 for maximum output.

SEARCH SENSITIVITY ADJUSTMENT (R2)

1. Connect a signal generator tuned to 1000KC, with 300-600 microvolts output, to the antenna receptacle.
2. Set R2 for maximum resistance (fully ccw). Depress "Loc" search button.
3. While the tuner is 'searching", slowly rotate R2 until tuner stops.

PUSHBUTTON ADJUSTMENT

1. Pull pushbutton out.
2. Tune manually to desired station.
3. Press button in firmly.
4. Repeat for remaining buttons.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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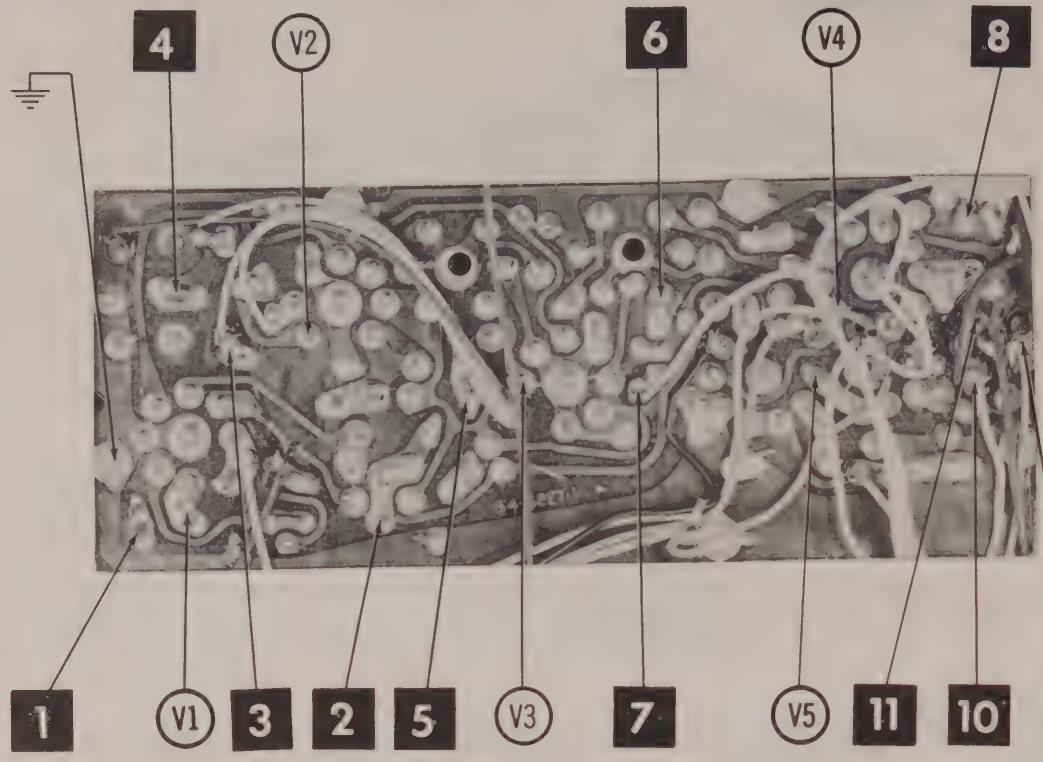
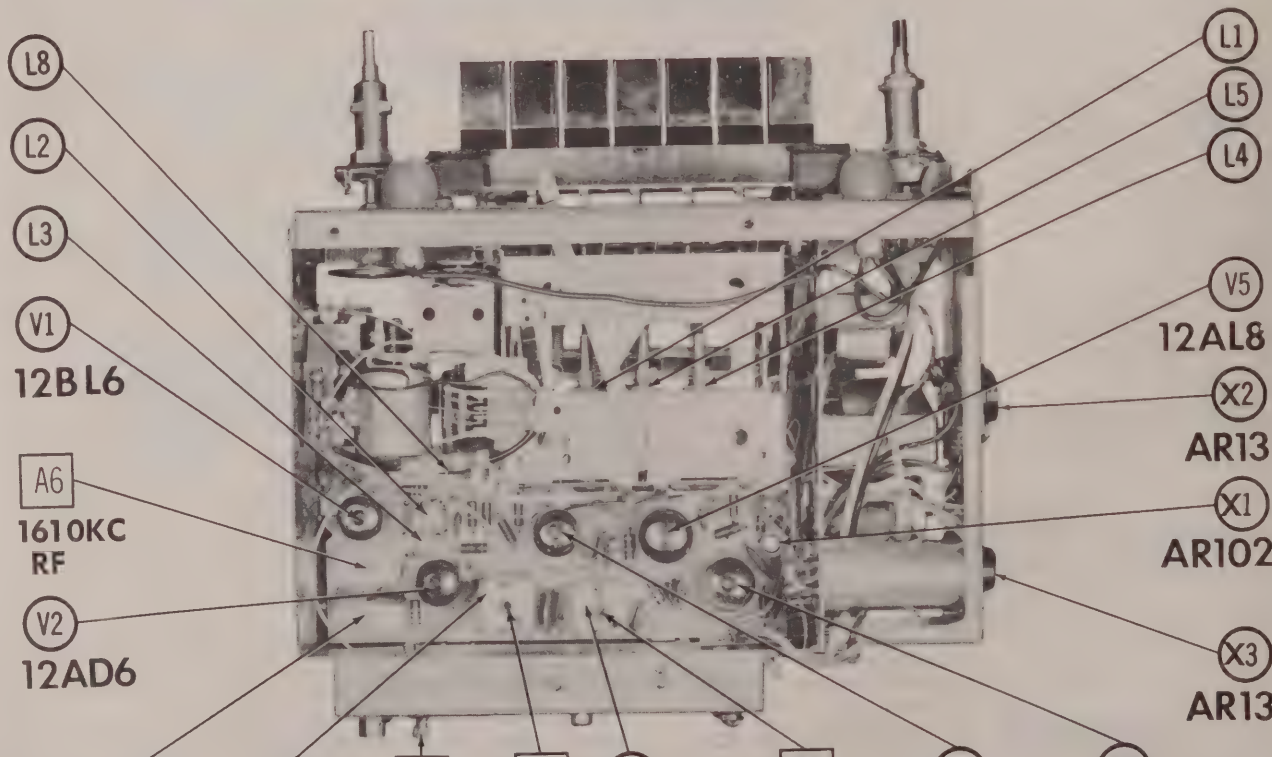


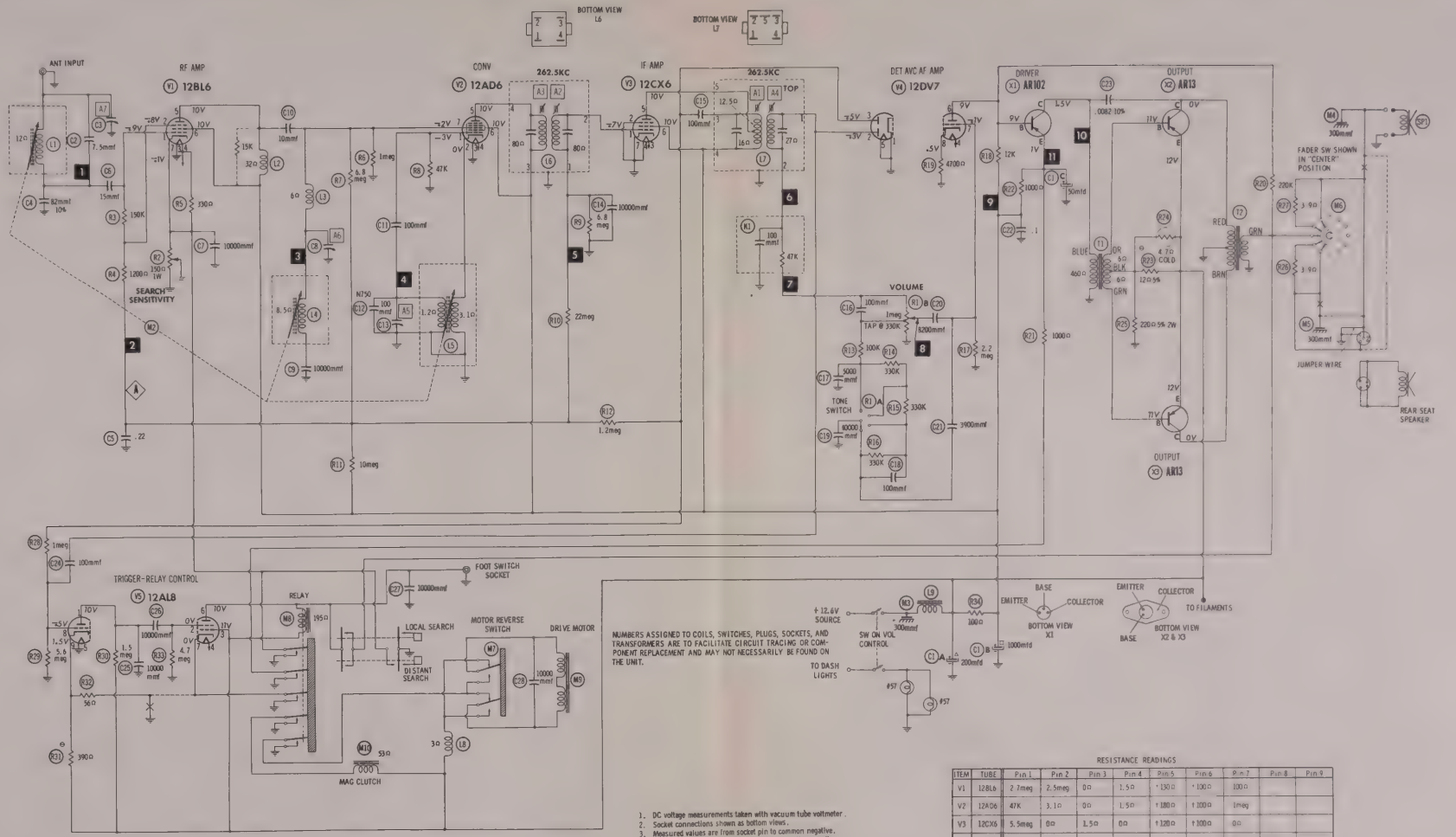
A Howard W. Sams CIRCUITRACE® Photo

PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



CHASSIS - TOP VIEW



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12BL6	2.7meg	2.5meg	0Ω	1.5Ω	†130Ω	†100Ω	100Ω		
V2	12AD6	47K	3.1Ω	0Ω	1.5Ω	†180Ω	†100Ω	1meg		
V3	12CX6	5.5meg	0Ω	1.5Ω	0Ω	†120Ω	†100Ω	0Ω		
V4	12DV7	0Ω	1meg	3meg	1.5Ω	0Ω	†12K	2.2meg	4700Ω	
V5	12AL8	†1.5meg	4.7meg	†0Ω	1.5Ω	0Ω	†195Ω	INF	3meg	†390Ω

TRANSISTOR CIRCUIT RESISTANCE NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.
† MEASURED FROM POSITIVE TERMINAL C1A

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

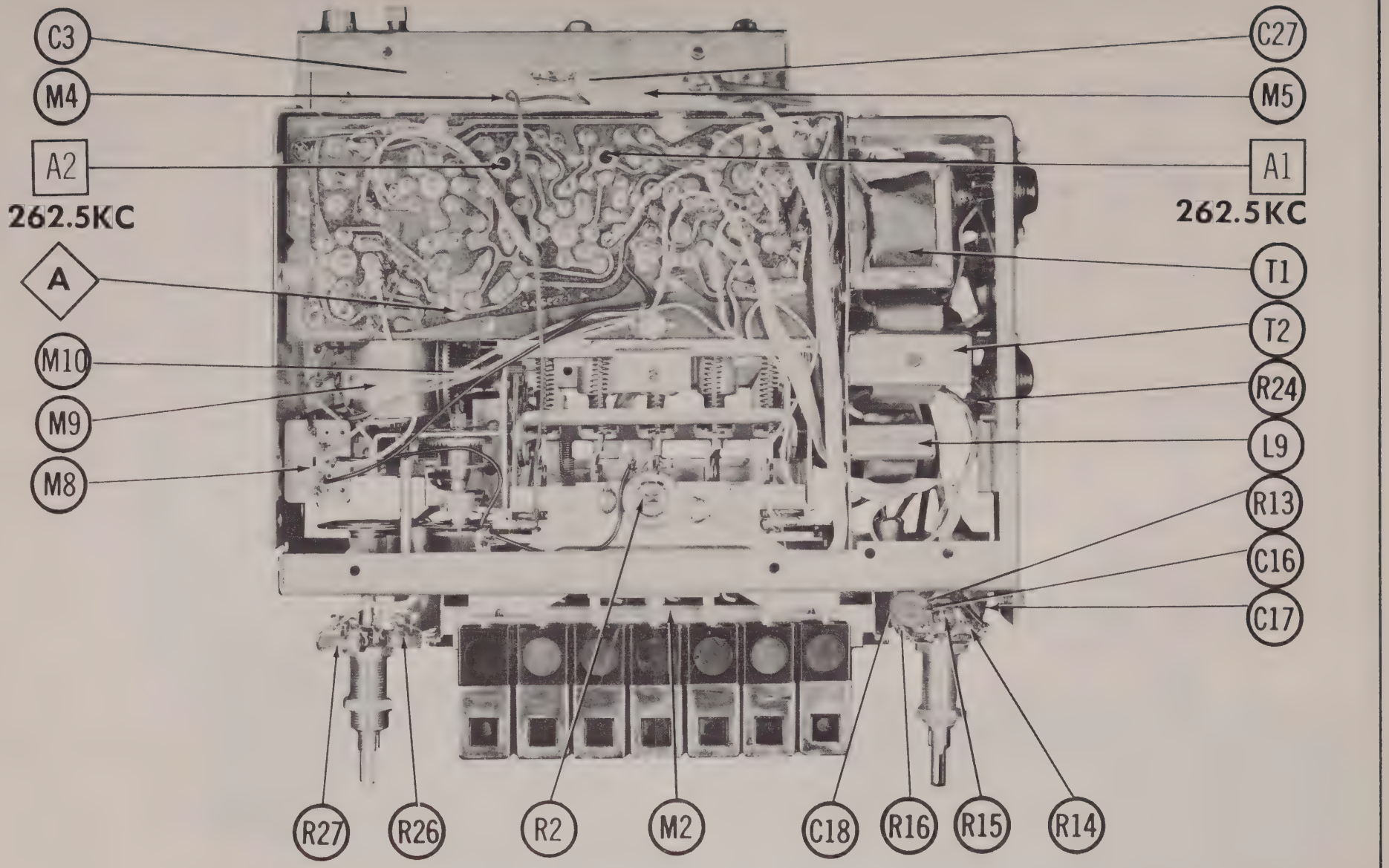
⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

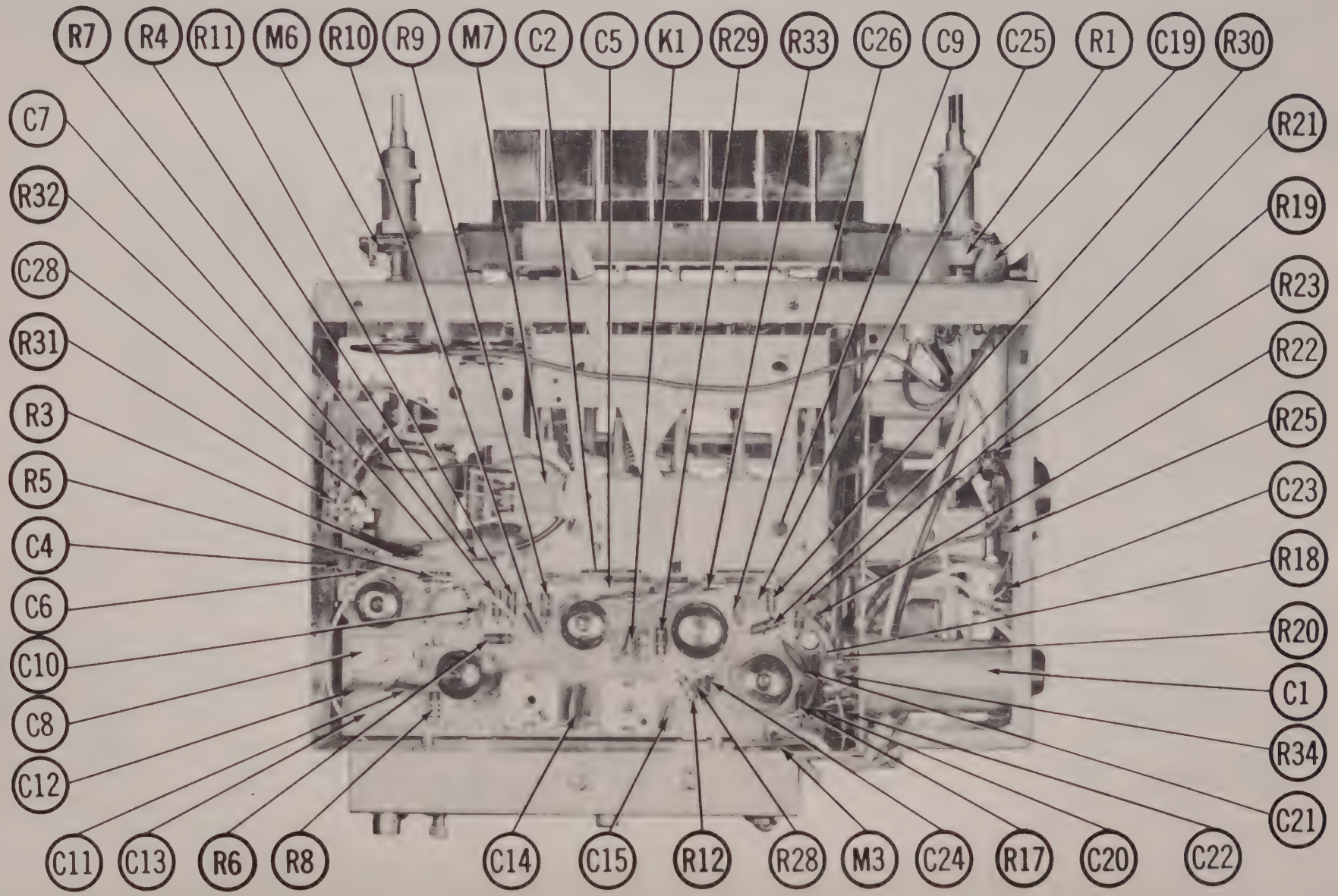
A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

© Howard W. Sams & Co., Inc. 1959

MOPAR
MODEL 929



CHASSIS - BOTTOM VIEW



CHASSIS TOP VIEW - CAPACITOR, RESISTOR, & MISC. IDENT.

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	12BL6	
V2	Converter	12AD6	
V3	IF Amplifier	12CX6	
V4	Det. -AVC-AF Amp.	12DV7	
V5	Trigger-Relay Control	12AL8	

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	AR102	Driver			2N362		PNP
X2	AR13	Output	LT52				PNP } Matched
X3	AR13	Output	LT52				PNP } Pair

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	PHILCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	▲200	16	61-0086-13	AFH3-00-95				TVLS-3026.9*	
	■1000	16							
	50	16							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	7.5			30-1224-132		DD-7R5	L10V8		5GA-V75	
C3				31-6533-1						
C4	82		10%	62-08240901l	NPO-SI 82	DD-820	L10Q82	CNO-482	5GA-Q82	
C5	.22	100		30-4695-32	P288N-22		CUB2P22	GEM-2022	2TM-P22	
C6	15			30-1263-25	BPD-000015	DD-150	L10Q15	UC-5415	5GA-Q15	
C7	10000			30-1262	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C8				31-6532-3						
C9	10000			30-1238-2	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C10	10			30-1263-11	BPD-00001	DD-100	L10Q1	UC-541	5GA-Q1	
C11	100			30-1263-9	BPD-0001	DD-101	L10T1	UC-531	5GA-T1	
C12	100		N750	30-1263-14	N750-DI 100	DTN-100	C10T1U	CN7-310	5TCU-T1	
C13				31-6532-4						
C14	10000			30-1262	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C15	100			30-1263-9	BPD-0001	DD-101	L10T1	UC-531	5GA-T1	
C16	100			30-1251-24	BPD-0001	DD-101	L10T1	UC-531	5GA-T1	
C17	5000			30-1238-1	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C18	100			30-1263-9	BPD-0001	DD-101	L10T1	UC-531	5GA-T1	①
C19	40000			30-1238-19		DF-403	BYB6S4	GTM-214	4TM-S4	
C20	8200			30-1262-1			HD5D82	B-282		
C21	3900			30-1262-44	BPD-004	DD-392	L10D39	GEM-424	5GA-D39	
C22	.1	200		30-4650-47	P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C23	.0082	400	10%	30-1262-1				GEM-16282	5BF-D82	
C24	100			30-1263-30	BPD-0001	DD-101	L10T1	UC-531	5GA-T1	
C25	10000			30-1272-2	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C26	10000			30-1272-2	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C27	10000			30-1238-2	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C28	10000			30-1238-2	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	

① Some versions may use 2000mmf in this application (Part #30-1238-12).

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	PHILCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	Switch		33-5570-4				■ UE4020-S	Tone
B	1meg	½						Volume, Tap ⓐ 330K
C	Switch							Power On-Off
R2	150Ω	1 (ww)	33-5591-4		39-150		FL-150	Search Sensitivity

■ "STA-LOC" equivalent: TS-3, RU16T334, CS1250A, IS1750, US42

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		PHILCO PART No.	NOTES
	OHMS	WATT		
R3	150K		66-4158340	
R4	1200Ω		66-2128340	
R5	330Ω		66-1338340	
R6	1meg		66-5108340	
R7	6.8meg		66-5688340	
R8	47K		66-3478340	
R9	6.8meg		66-5688340	
R10	22meg		66-6228340	
R11	10meg		66-6108340	
R12	1.2meg		66-5128340	
R13	100K		66-4108340	
R14	330K		66-4338340	
R15	330K		66-4338340	
R16	330K		66-4338340	
R17	2.2meg		66-5228340	
R18	12K		66-3128340	
R19	4700Ω		66-2478340	
R20	220K		66-4228340	
R21	1000Ω		66-2108340	
R22	1000Ω		66-2108340	
R23	12Ω 5%		66-0128340	Note 1
R24	4.7Ω Cold		33-1343-16	
R25	220Ω 5%	2	66-1225240	
R26	3.9Ω		66-9398340	
R27	3.9Ω		66-9398340	
R28	1meg		66-5108340	
R29	5.6meg		66-5568340	
R30	1.5meg		66-5158340	
R31	390Ω		66-1398340	Note 2
R32	56Ω		66-0568340	
R33	4.7meg		66-5478340	
R34	100Ω		66-1108340	

Note 1. Some versions may use 18Ω 5% in this application (Part #66-0188340).
Note 2. Some versions may use 330Ω in this application (Part #66-1338340).

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	PHILCO PART No.	REPLACEMENT DATA
K1	Diode RF Filter	100mmf, 47K	30-6036-2	Sprague D-7

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		PHILCO PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Ant. Coil	32-4730-19						1.65MH
L2	RF Choke	32-4480-38						
L3	RF Choke	32-4480-35	19-4160	19-4160	TV-196	6120	VP-5	165uh
L4	RF Coil	32-4730-20						
L5	Osc. Coil	32-4730-21						
L6	Input IF	32-4773-1	16-6756	16-6756	BC-344	13-PH1		
L7	Output IF	32-4774-1						
L8	RF Choke	32-4422-24	19-1008	19-1008	BC-565	4609		5.6uh ①

① IRC Part # CL-1

PARTS LIST AND DESCRIPTIONS (Continued)

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ~)	PHILCO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L9	1.6A	.5Ω	.008 HY	32-8879-1						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	PHILCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	5.5	1	32-8870-1						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	PHILCO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	60Ω CT	3-4Ω	32-8834-1							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	PHILCO PART No.	QUAM PART No.	
SP1	5"	PM	3-4Ω	36-1670-3	57A15	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			PHILCO PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	SFE	7.5A	45-2656-33		30707.5 (7½A 32V)	155009	SFE 7½	HDH

MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M2	Tuner	76-11515-8	Complete
M3	Spark Plate	30-1254-1	300mmf
M4	Spark Plate	30-1254-1	300mmf
M5	Spark Plate	30-1254-1	300mmf
M6	Switch	42-2090	Fader
M7	Switch	76-11522	Motor Reversing & Bracket
M8	Relay	42-4036	
M9	Motor	76-10379-1	Includes Bracket
M10	Clutch Ass'y.	76-11514-5	Magnetic
	Printed Board	54-6827-1	

CABINETS & CABINET PARTS

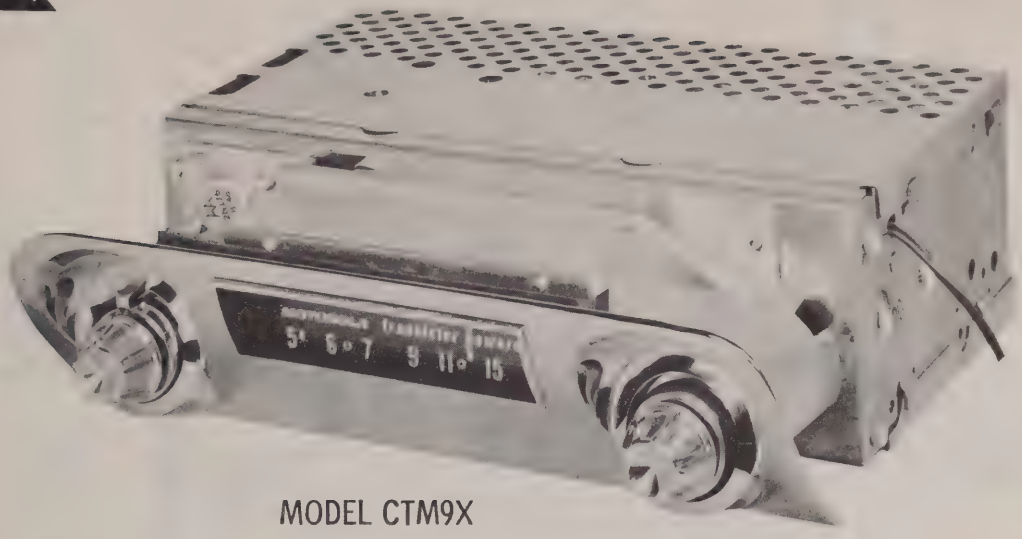
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Window	54-9996	
Bezel	28-11704-3	
Knob	27-4687-27	Tuning & Volume
Knob	28-11702	Tone & Fader
Pushbutton Ass'y.	76-11387-4	(5 Used)
Dial	54-5405	
Pointer Arm Ass'y.	76-11513-7	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
Use BELDEN No. 8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire ..... Use BELDEN No. 8885
Bonding Strap ..... Use BELDEN No. 8661

PHOTOFACT* Folder



MODEL CTM9X

TRADE NAME	Motorola Models CT M9X (For 1959 Chevrolet Automobiles), PCA9X(For 1959 Pontiac Automobiles), 9AX
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois (Universal Type)
TYPE SET	Battery Operated 4 Tube AM Automobile Receiver With Transistorized Output
POWER SUPPLY	12 Volt Storage Battery RATING 3 Amp. @12.6 Volts DC
TUNING RANGE—BROADCAST	540KC - 1610KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:
A1, A2, A3, A4.... GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545
A5, A6, A7..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A8, A9, A10..... GENERAL CEMENT #9050L, 9150
WALSCO #2521

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to pin 7 (grid) of converter. Low side to chassis.	262.5KC (400∿ Mod.)	High Freq. end stop	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	Fig. 1	Thru dummy to antenna receptacle.	1610KC	"	"	A5, A6, A7	"
	Step 3 is not necessary unless tuner has been tampered with or associated components have been replaced. If necessary, back tuning (A8, A9, A10) 7/16" out of coils. Repeat step 2.						
3.	Fig. 1	Thru dummy to antenna receptacle.	1200KC	Tuning carriage 9/32" from high end stop.	Across voice coil	A8, A9, A10	Adjust for maximum output. Repeat steps 2 and 3 until no further increase is noted.
	With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust A7 for maximum output.						

PUSHBUTTON ADJUSTMENT

1. Pull out pushbutton.
2. Tune manually to desired station.
3. Press button in firmly.
4. Repeat for remaining buttons.

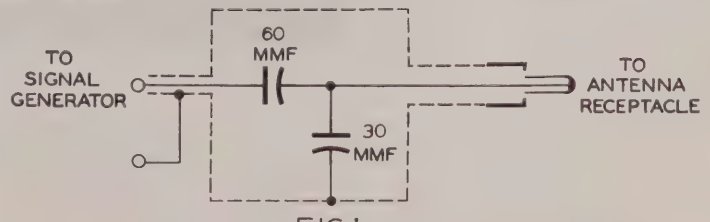


FIG. 1

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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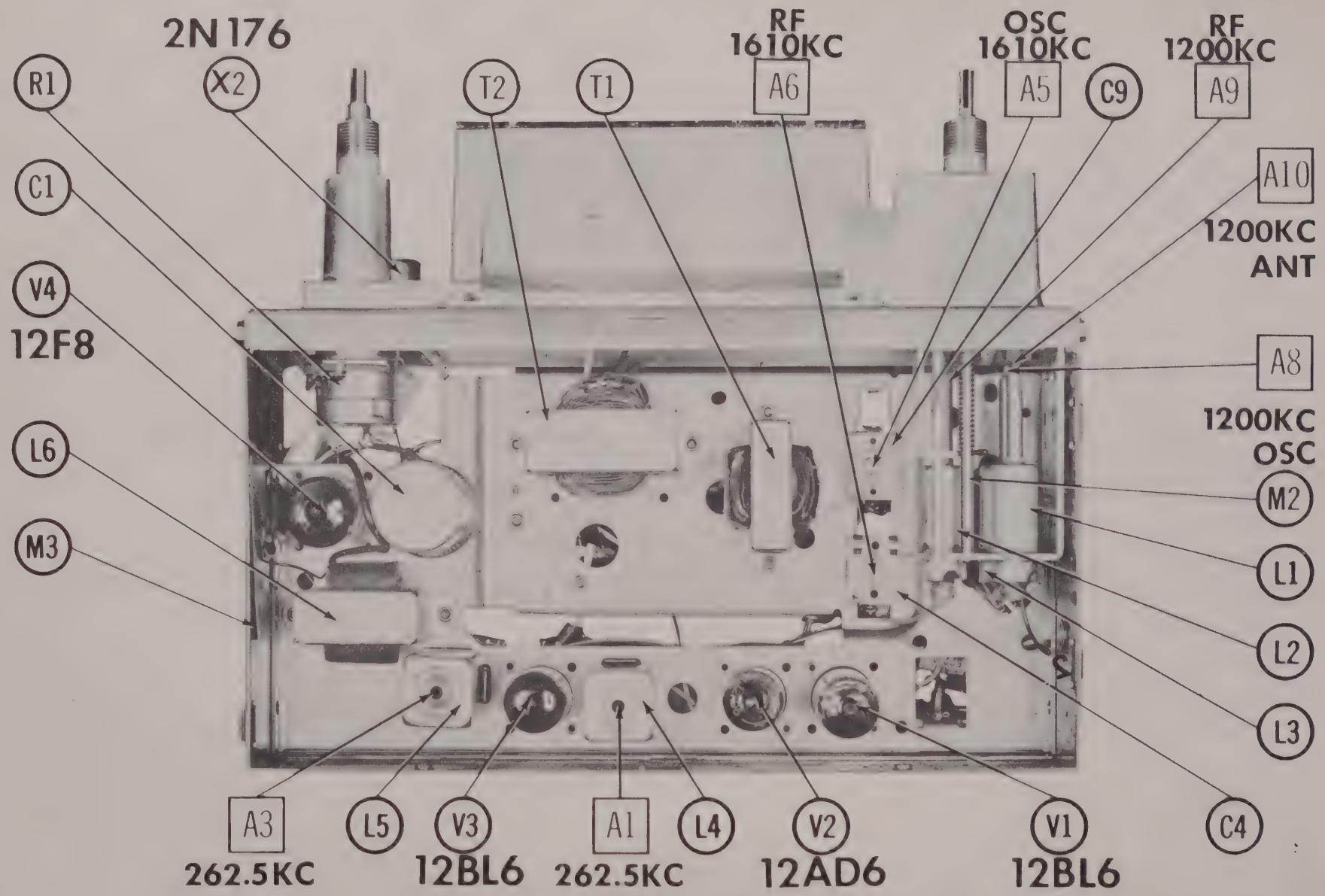
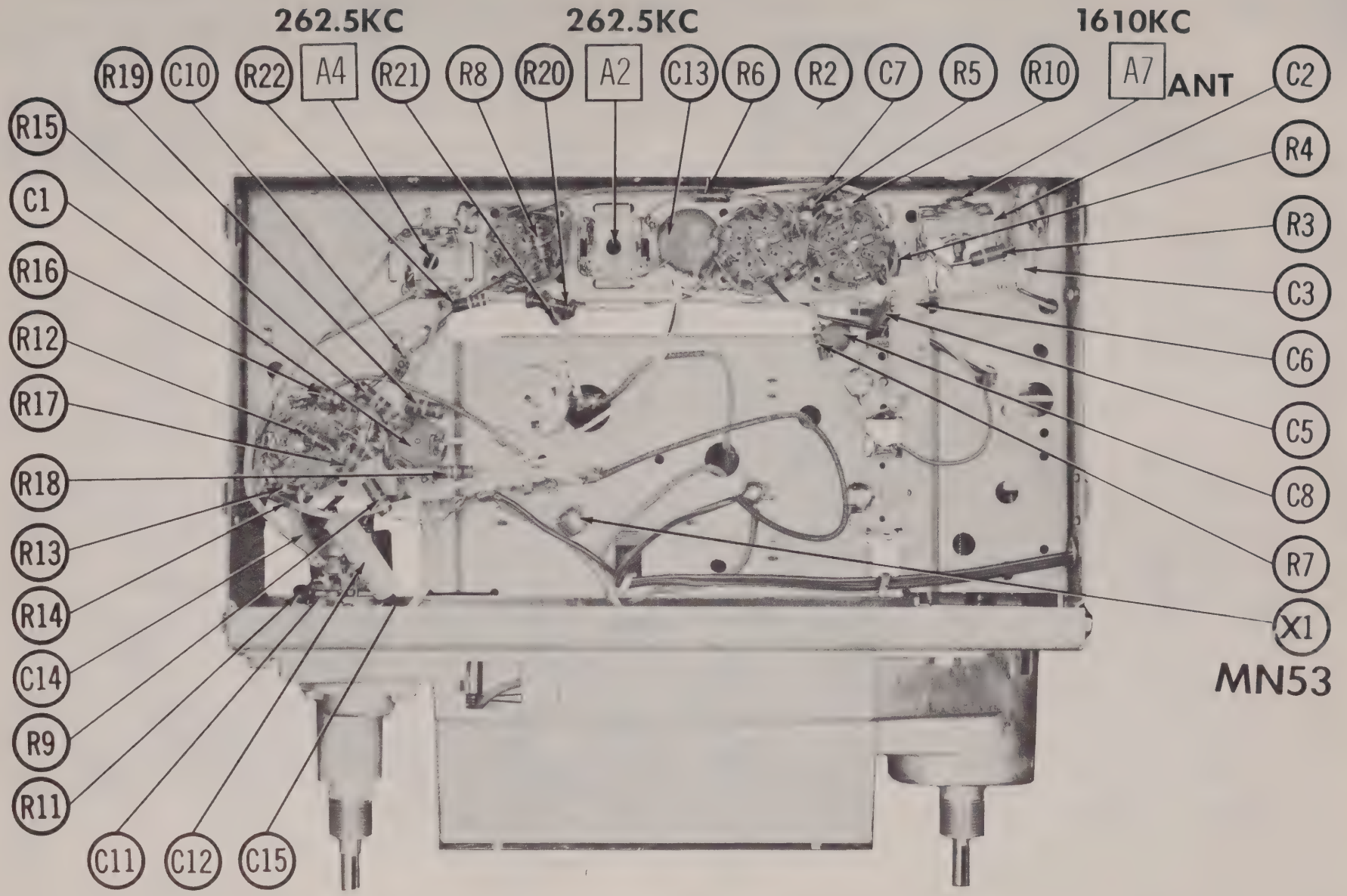
JD216

MOTOROLA MODELS
CTM9X, PCA9X, 9AX
SET 455 FOLDER 12



CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	12BL6	
V2	Converter	12AD6	

ITEM No.	USE	TYPE	NOTES
V3	IF Amplifier	12BL6	
V4	Det.-AVC-AF Amp.	12F8	

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	MN-53*	Driver		2N591	MN-53		PNP
X2	2N176	Output	2N155	2N176		2N176	PNP Note 1

Note 1. When replacing, apply DC-4 grease (Part #11M490487) or equivalent to both sides of insulator. Tighten mounting screws securely.

* Some versions may use 2N652 in this application.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	■500	16	23B543279	AFH3-00-95		WP300.85		TVLS-3026.8*	
B	▲500	16							
C	100	16							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	40-430			20A542758						
C3	.002	1000	10%	8R122291				GEM-1622	10TM-D2S 10%*	
C4	20-120			20K541014						
C5	47		N750 10%	21R114207	N750-DI 47	DTN-47	C10V47U	CN7-447	5TCU-Q47S 10%*	
C6	.05	200		8R121005	P288N-05	DF-503	CUB2S5	GEM-215	2TM-S5	
C7	1500			21R120100	BPD-0015	DD-152	BYA10D15	B-215	5HK-D15	
C8	47		N750	21R115593	N750-DI 47	DTN-47	C10V47U	CN7-447	5TCU-Q47S 10%*	
C9	395-470			20A485708						①
C10	27		NPO 10%	21R410089		TCZ-27	C10V27C	CNO-427	5TCC-Q27S 10%*	
C11	10000			21R482726	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C12	.002	600		8R121568	P688N-002	DD-202	CUB6D2	GEM-622	6TM-D2	

CAPACITORS (cont)

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C13	10000			21R482726	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C14	10000			21R482726	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C15	25000			21K740506	BPD-02	DD-203	BYA10S2	B-120	5HK-S25	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

① Models PCA9X, 9AX use 310-390mmf in this application (Part #20K541700).

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K		18C543337 ①	F1-41		†QJ1097A	ǂ UE3966-S	Tone
B	2meg			R2-72				Volume, Tap ⓐ 1meg
C	Switch			KR-4				Power On-Off
R2	300Ω	1WW	18K543493 ②		39-300 *		FL-500 *	Bias, Stop ⓐ 36Ω

* Use 36Ω resistor in series with terminal.

† "Concentrikit" equivalent: K-6 Kit, with base elements & shafts: B13-133, P13-214 (Panel) B18-139X, R1-226 (Rear) 76-1 (Switch)

ǂ "STA-LOC" equivalent: FA55A, OS2437, RU26T16, IS2812, US41

① Model 9AX uses Part #18B542899; Model PCA9X uses part #18K543693.

② Some versions of Model 9AX may use 210Ω with 82Ω series resistor in this application.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		MOTOROLA PART No.	NOTES
	OHMS	WATT		
R3	22K		6K119405	
R4	22meg		6R118247	
R5	3300Ω		6K121725	
R6	1meg		6K124494	
R7	47K		6K121687	
R8	330Ω		6K127940	Note 1
R9	4.7meg		6K122326	
R10	91 meg		6K538716	
R11	100K		6K122313	
R12	3.3meg		6K121278	

ITEM No.	RATING		MOTOROLA PART No.	NOTES
	OHMS	WATT		
R13	2.7meg		6R488136	
R14	3.3meg		6K119407	
R15	3300Ω		6K119926	Note 2
R16	22K		6K119935	Note 3
R17	100Ω		6R6326	Note 3
R18	10K		6R6054	Note 3
R19	680Ω		6R6040	
R20	10Ω Cold		6K540634	
R21	10Ω		6K124668	
R22	330Ω			Note 4

Note 1. Some versions may use 470Ω in this application (Part #6K127633).

Note 2. Some versions may use 2700Ω in this application (Part #6K119926).

Note 3. Not used in some versions.

Note 4. Some versions may use 680Ω in this application (Part #6R6040).

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		MOTOROLA PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Ant. Coil	24K562145 †						
L2	RF Coil	24K562146 †						
L3	Osc. Coil	24K562144 †						
L4	Input IF	24B543286	16-6752	16-6752	BC-350	12-H2	RF-3	
L5	Output IF	24K543287	16-6754	16-6754	BC-354	12-H6		

† Part of M2. Models PCA9X, 9AX use Part #24C535458 for L1 & L2, and Part #24C535456 for L3.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ~)	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L6	3A	.3Ω	.010 HY	25B543338						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	20	1	25B543340①						① Part #25K543448 used in Models PCA9X, 9AX

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE	REPLACEMENT DATA							NOTES
	PRI.	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	24Ω Tap ⓐ 3-4Ω	25C542489①							① Part #25K543444 used in PCA9X, 9AX

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	
SP1	6"x 9"	PM	3-4Ω	50C543343	69A3	Model CTM9X
	6"x 9"	PM	3-4Ω	50C541101	69A3	Used in Model 9AX
	4"x 8"	PM	3-4Ω	50K543694	46A15	Used in Model PCA9X

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MOTOROLA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1		10A 32V	65R10266 ①	②				

① Part #65R16248 (9A 32V) used in Models 9AX, PCA9X.
② Part #9K541619 used in Model PCA9X.
Part #1V541705 used in Model 9AX.

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M2	Tuner	77K562140	(MT-269) Complete, Model CTM9X
	Tuner	77D561088	(AT-253) Complete, Model 9AX
	Tuner	77K562643	(AT-290) Less Push Buttons And Pointer, Model PCA9X
M3	Spark Plate	64K530177	1" x 2"
	Spark Plate	64K561877	1"x 1 3/ 8", Models 9AX & PCA9X only

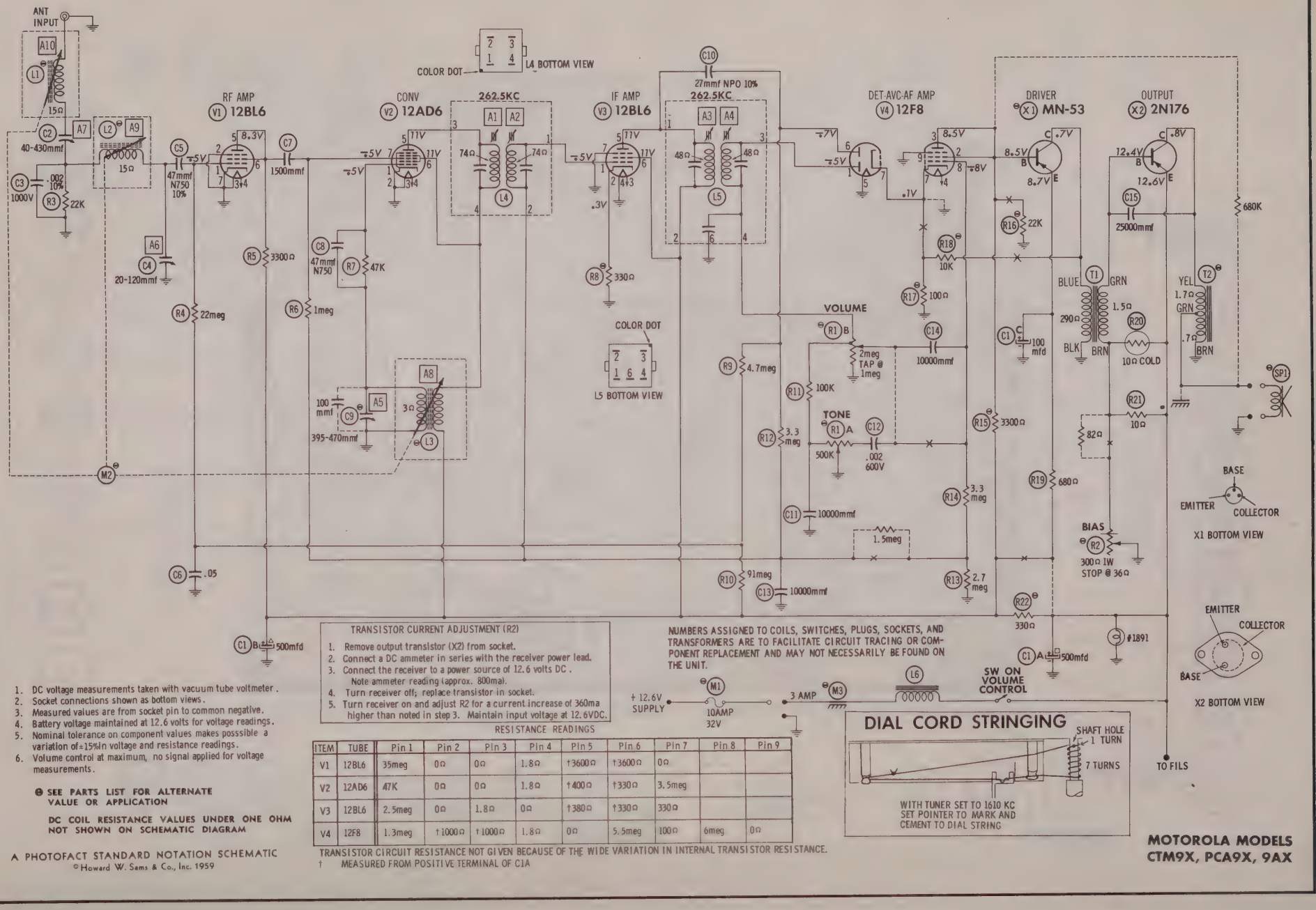
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	36B542650	Tuning, Volume-On-Off, Model CTM9X
Knob	36B543382	Tuning, Volume-On-Off, Model 9AX
Knob	36B542650	Tuning, Volume-On-Off, Model PCA9X
Knob	36B543330	Tone, Model CTM9X
Knob	36B513220	Tone, Model PCA9X
Knob	36B543398	Tone, Model 9AX
Knob	36B543332	Dummy, Model CTM9X
Knob	36K543399	Dummy, Model 9AX
Knob	36K513223	Dummy, Model PCA9X
Pushbutton	38B542665	Model 9AX
Pushbutton	1V543674	Model PCA9X
Cover	15C543303	Top And Bottom
Pointer	1K543313	Model CTM9X
Pointer	1V543492	Model 9AX
Pointer	1V543735	Model PCA9X
Dial Scale	34B543373	Model CTM9X
Dial Scale	34B541013	Model 9AX
Dial Scale	34B543658	Model PCA9X

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire ..... Use BELDEN No. 8885
Bonding Strap ..... Use BELDEN No. 8661



TRANSISTOR CURRENT ADJUSTMENT (R2)

1. Remove output transistor (X2) from socket.
2. Connect a DC ammeter in series with the receiver power lead.
3. Connect the receiver to a power source of 12.6 volts DC. Note ammeter reading (approx. 800ma).
4. Turn receiver off; replace transistor in socket.
5. Turn receiver on and adjust R2 for a current increase of 360ma higher than noted in step 3. Maintain input voltage at 12.6VDC.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12BL6	35meg	0Ω	0Ω	1.8Ω	†3600Ω	†3600Ω	0Ω		
V2	12AD6	47K	0Ω	0Ω	1.8Ω	†400Ω	†330Ω	3.5meg		
V3	12BL6	2.5meg	0Ω	1.8Ω	0Ω	†380Ω	†330Ω	330Ω		
V4	12F8	1.3meg	†1000Ω	†1000Ω	1.8Ω	0Ω	5.5meg	100Ω	6meg	0Ω

TRANSISTOR CIRCUIT RESISTANCE NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.
† MEASURED FROM POSITIVE TERMINAL OF C1A

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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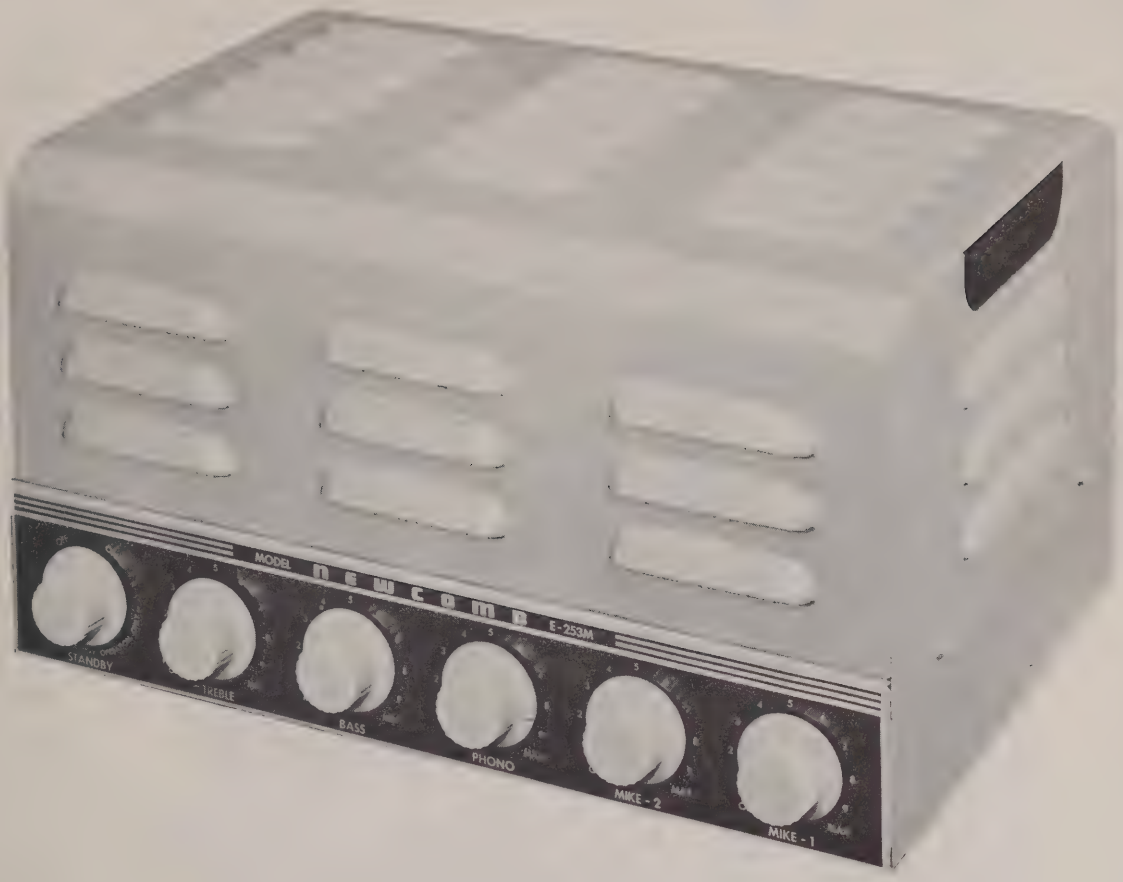
MOTOROLA MODELS CTM9X, PCA9X, 9AX

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

NEWCOMB
MODEL E-253M

NEWCOMB
MODEL E-253M



NEWCOMB
MODEL E-253M

TRADE NAME	Newcomb Model E-253M
MANUFACTURER	Newcomb Audio Products Co., 6824 Lexington Ave., Hollywood 38, California
TYPE SET	AC-Battery Operated 7 Tube Audio Amplifier
POWER SUPPLY	110-120 Volts AC, 60 Cycles (or) 12 Volt Storage Battery
RATING	100 Watts, .96 Amp. @ 117 Volts AC (or) 8 Amp. @ 12.6 Volts DC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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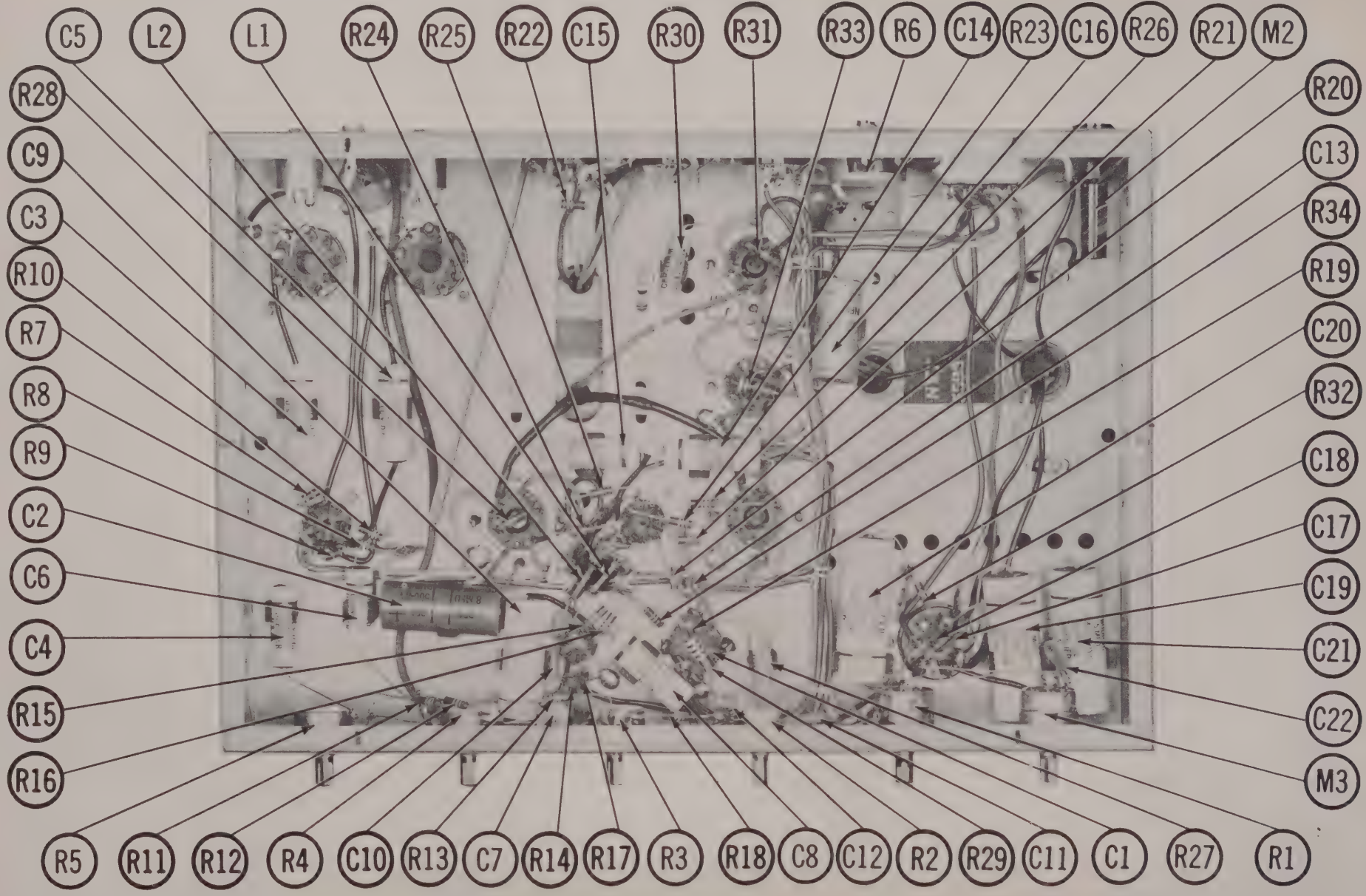
SET 455 FOLDER 13



CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Mike 1 Preamplifier- Mike 2 Preamplifier	12AX7	
V2	AF Amplifier	12AU6	
V3	AF Amp. -Phase Inv.	12AU7A	
V4	Output	6L6GB	
V5	Output	6L6GB	
V6	Rectifier	6X5GT	
V7	Rectifier	6X5GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	NEWCOMB PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	20	475	CE-30	AFH4-19-10	C0260	FP474.5	TMT-34	TVL-3779	
B	10	475			BBR25-50		TD-25-50	TVA-1306	
C	10	475							
D	25	50							
C2	8	500		PRS500V8	BR850	TC81	TD-8-500	TVA-1902	

FIXED CAPACITORS

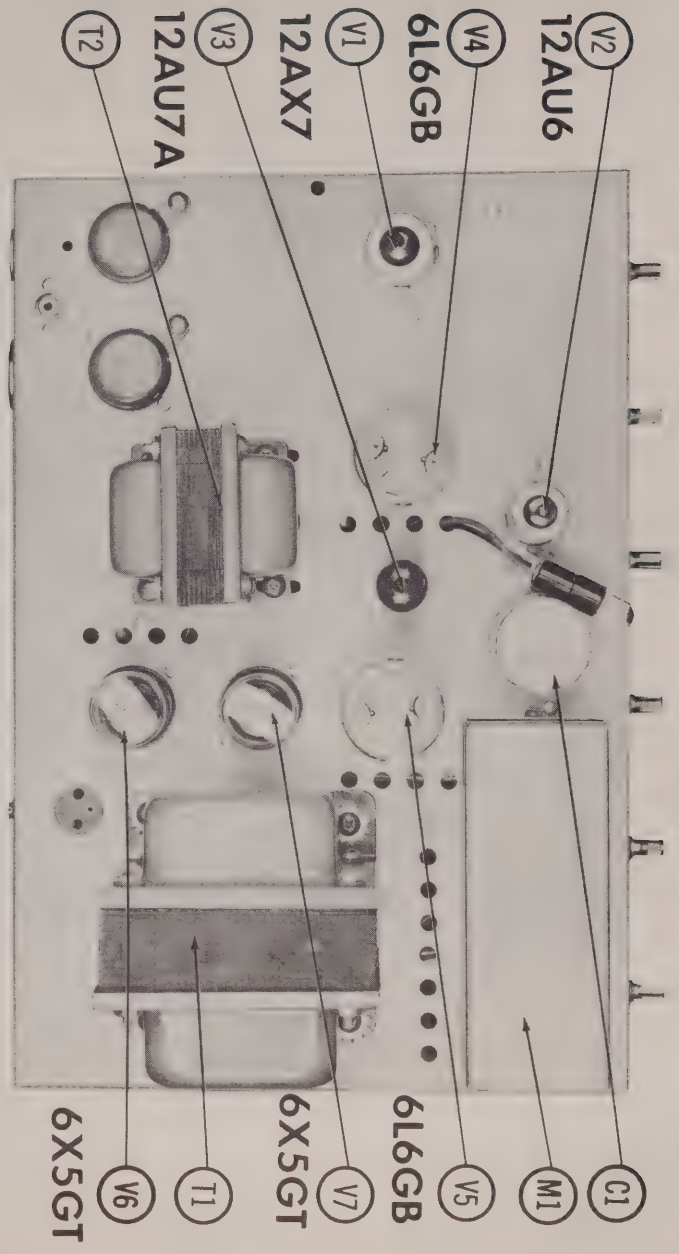
Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	NEWCOMB PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	.1	400			P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C4	.022	600			P688N-022	DD-203	CUB6S22	GEM-6122	6TM-S22	
C5	.1	400			P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C6	.022	600			P688N-022	DD-203	CUB6S22	GEM-6122	6TM-S22	
C7	.1	400			P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C8	.047	600			P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C9	.25	400			P488N-25		CUB4P25	GEM-4025	4TM-P25	
C10	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C11	1500				BPD-0015	DD-152	BYA10D15	B-215	5HK-D15	
C12	470				BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C13	100				BPD-0001	DD-101	BYA10T1	B-310	5GA-T1	
C14	.047	600			P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C15	.047	600			P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C16	.015	2000					MCC20S15			
C17	5000				BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C18	5000				BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C19	.5	400			P488N-5		CUB4P5	GEM-405	4TM-P5	
C20	.5	400			P488N-5		CUB4P5	GEM-405	4TM-P5	
C21	.5	400			P488N-5		CUB4P5	GEM-405	4TM-P5	
C22	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	NEWCOMB PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2meg	½	RV-52	B-77	A47-2meg-S	Q17-140	U56	Treble
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			KR-2	SWE-20	76-2	US-27	Power On-Off
R2	15meg	½	RV-40					Bass
R3	5meg	½	RV-89					Phono, Tap ⓐ 3meg
R4A	500K	½	RV-41	B-60	A47-500K-Z	Q13-133	U48	Mic 2
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R5A	500K	½	RV-41	B-60	A47-500K-Z	Q13-133	U48	Mic 1
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R6A	100Ω	2(WW)	RV-50	WN-101	A43-100	WPK-100	R100L	Hum Balance
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	NEWCOMB PART No.	NOTES
R7	4.7meg			
R8	180K			
R9	4.7meg			
R10	180K			
R11	560K			
R12	560K			
R13	270K			
R14	560K			
R15	180K			
R16	560K			
R17	1000Ω			
R18	560K			
R19	220K			
R20	56K			

ITEM No.	RATING OHMS	RATING WATT	NEWCOMB PART No.	NOTES
R21	1800Ω			
R22	68K			
R23	27K			
R24	100K			
R25	1800Ω			
R26	270K			
R27	250Ω	5		
R28	270K			
R29	33K	1		
R30	5000Ω	5		
R31	12K			
R32	15Ω			
R33	47Ω	1		
R34	56K			

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA NEWCOMB PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Fil. Choke							2uh
L2	Fil. Choke							2uh

TRANSFORMER (POWER)

ITEM No.	RATING AC OPERATION PRI.	SEC. 1	SEC. 2	REPLACEMENT DATA NEWCOMB PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .96A	740VCT @ .130A	15V not used tap @ 12VCT @ 2A	TR-190						
	SEC. 3									
	15VCT Not used									
	DC OPERATION									
	PRI. 1	PRI. 2	SEC. 1							
	12VCT @ 2.5A	18V not used tap @ 12VCT @ 2.5A	720VCT @ .120A							
	SEC. 2									
	125V Not used									

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	SEC.	REPLACEMENT DATA NEWCOMB PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	5200Ω CT	500Ω tap @ 70V, 16Ω, 8Ω, 4Ω	TR-188	22S70 ①				22S70 ①		① Use 250Ω tap for 70V line.

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA NEWCOMB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	NOTES
M1		12V	60~		12VB6			

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA NEWCOMB PART No. FUSE	NEWCOMB PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M2	MDL	1.6A 125V S/B			31301.6 (3AG 1 6/10A 125V S/B)	341001	MDL 1 6/10	HKP

MISCELLANEOUS

ITEM No.	PART NAME	NEWCOMB PART No.	NOTES
M3	Switch		Battery -Standby

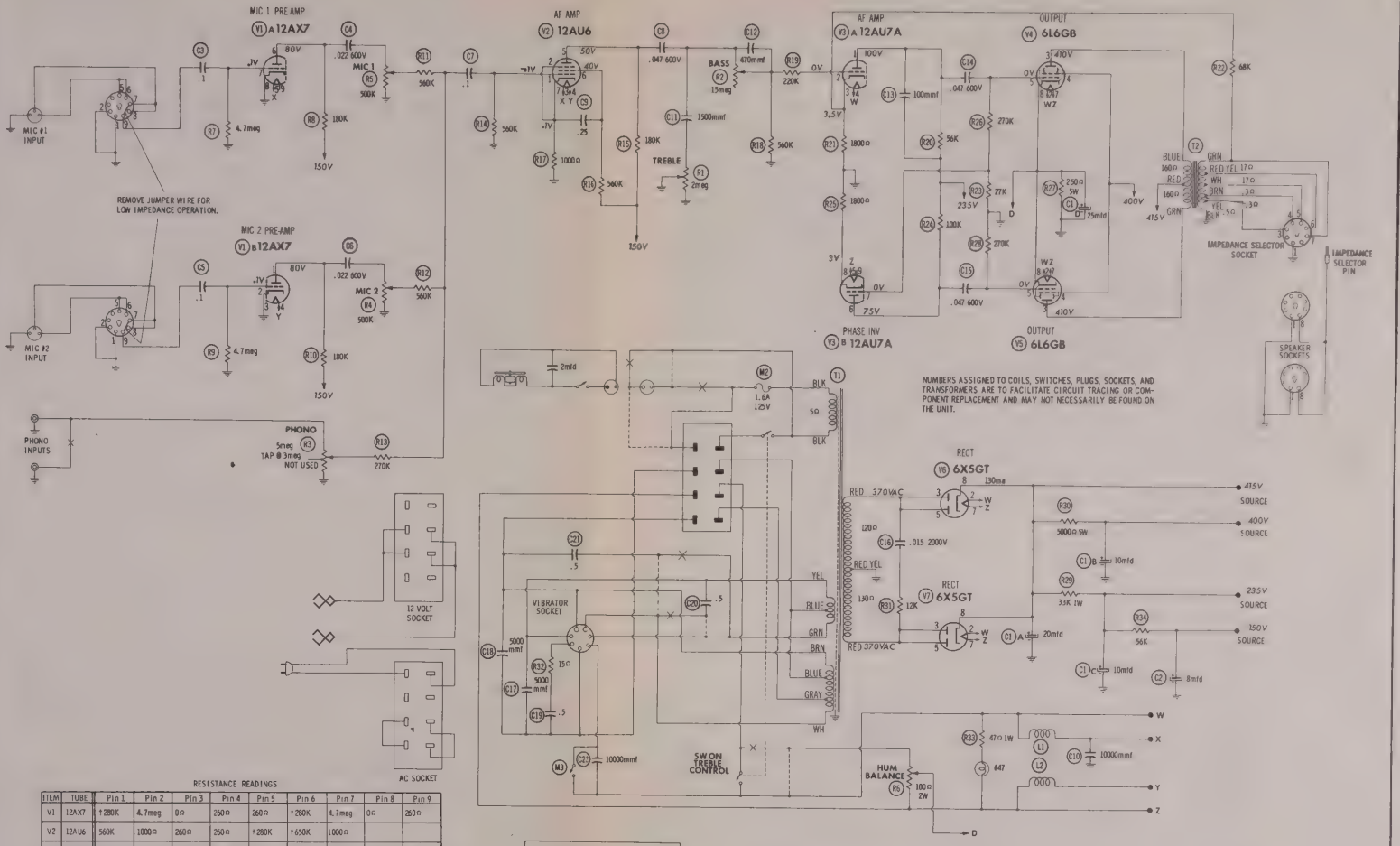
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†280K	4.7meg	0Ω	260Ω	260Ω	†280K	4.7meg	0Ω	260Ω
V2	12AU6	560K	1000Ω	260Ω	260Ω	†280K	†650K	1000Ω		
V3	12AU7A	†90K	780K	1800Ω	260Ω	260Ω	†133K	27K	1800Ω	260Ω
V4	6L6GB	TP	260Ω	†160Ω	†5000Ω	300K	NC	260Ω	250Ω	
V5	6L6GB	TP	260Ω	†160Ω	†5000Ω	270K	NC	260Ω	250Ω	
V6	6X5GT	0Ω	260Ω	120Ω	0Ω	120Ω	TP	260Ω	¶	
V7	6X5GT	0Ω	260Ω	130Ω	0Ω	130Ω	TP	260Ω	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V7.
NC NO CONNECTION.
TP TIE POINT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±10% in voltage and resistance readings.
6. All controls at minimum, proper output load connected

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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NEWCOMB
MODEL E-253M

PHOTOFACT* Folder

OLYMPIC MODELS
460, 461

MODEL 461

TRADE NAME	Olympic Models 460, 461
MANUFACTURER	Olympic Radio & Tel. Corp., 34-01 38th Ave., Long Island City 1, N. Y.
TYPE SET	AC-DC-Battery Operated 4 Tube Portable AM Receiver
POWER SUPPLY	110-120 Volts AC (or) 1.5 Volts DC "A" Supply & 67.5 Volts DC "B" Supply
RATING	2.5 Watts, .11 Amp. @ 117 Volts AC (or) 120 MA @ 1.5 Volts DC & 7.5 MA @ 67.5 Volts DC
TUNING RANGE—BROADCAST	535 - 1650KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:

A1 thru A4..... GENERAL CEMENT #9087, 9089
WALSCO #2528

A5, A7..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

A6..... GENERAL CEMENT #8282, 8606, 8606L, 9091
WALSCO #2526, 2541, 2543, 2544

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.		Loop	455KC (400~ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.		"	1650KC	"	"	A5	"
3.		"	600KC	600KC	"	A6	"
4.		"	1400KC	1400KC	"	A7	"

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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HF937

SET 455 · FOLDER 14

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	1R5-SF	1AQ5 *
V2	IF Amplifier	1T4-SF	1AM4 *
V3	Det. -AVC-AF Amp.	1U5-SF	1AS5 *
V4	Output	3S4-SF	3W4 *

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	OLYMPIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	40	150					TDLT-17	TVAS-3428 *	
B	40	150							
C	200	25							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	OLYMPIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	10				SI 10	D6-100	L10Q1	UC-541	5GA-Q1	
C3	.01	500			P685N-01	D6-103	WMF6S1E	GTM-611	6EP-S10	
C4	5000				BPD-005	DD-502	BYA10D5	B-250	5GA-D5	
C5	100		10%		NPO-SI 100	TCZ-100	L10T1	ZT-531	5GA-T1S 10%	
C6	5000				BPD-005	DD-502	BYA10D5	B-250	5GA-D5	
C7	200				SI 200	D6-201	L10T2	UC-532	5GA-T2	
C8	200				SI 200	D6-201	L10T2	UC-532	5GA-T2	
C9	.01	500			P685N-01	D6-103	WMF6S1E	GTM-611	6EP-S10	
C10	100				SI 100	D6-101	L10T1	UC-531	5GA-T1	
C11	200				SI 200	D6-201	L10T2	UC-532	5GA-T2	
C12	.002	400			P485N-002	DD-202	WMF4022E	GTM-4222	6EP-D20	
C13	200				SI 200	D6-201	L10T2	UC-532	5GA-T2	
C14	.05	400			P485N-05	DF-503	WMF4S47E	GTM-4147	4EP-S50	
C15	.05	400			P485N-05	DF-503	WMF4S47E	GTM-4147	4EP-S50	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	OLYMPIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	1meg	½	02582					Volume & Switch

RESISTORS

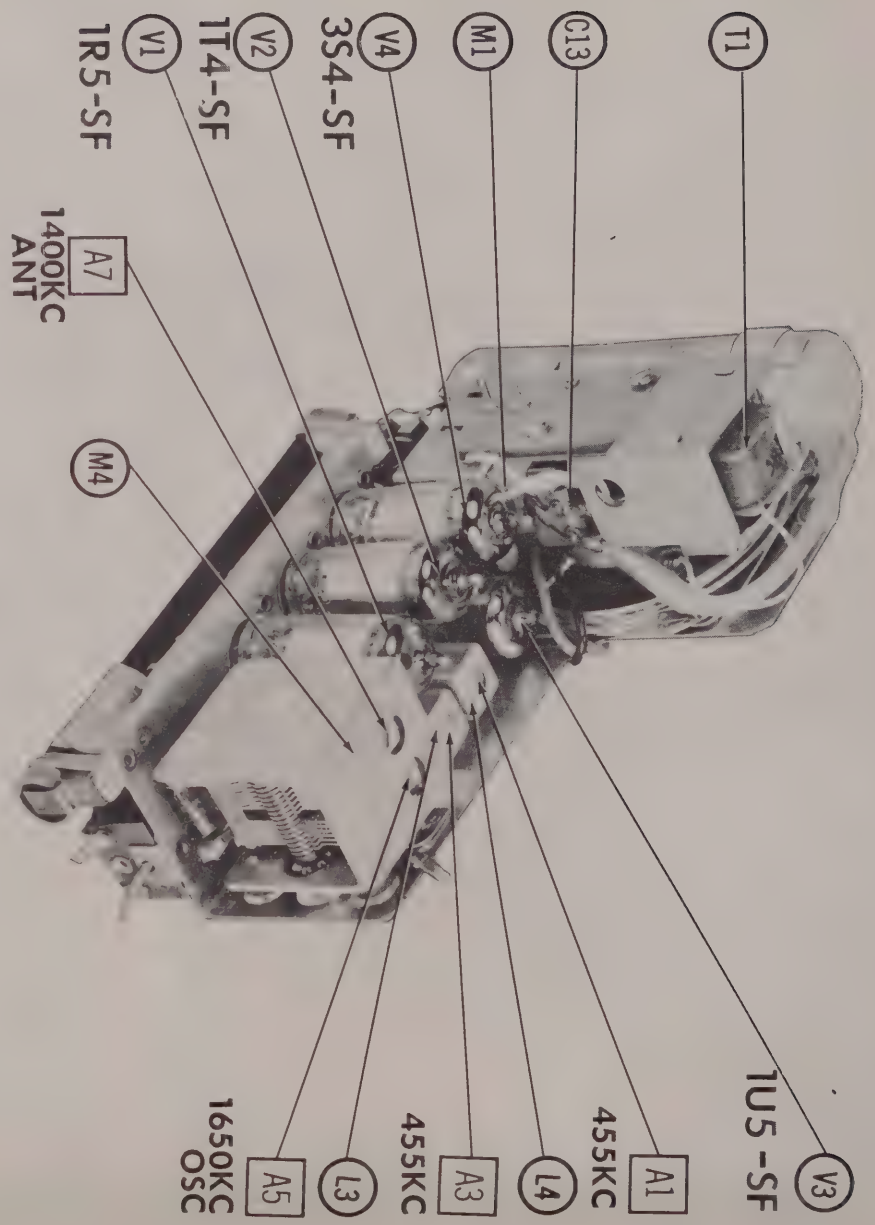
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		OLYMPIC PART No.	NOTES
	OHMS	WATT		
R2	100K			
R3	5.1meg			Note 1
R4	22K			
R5	3meg			Note 2
R6	10meg			
R7	3meg			Note 2
R8	470K			
R9	3.3meg			
R10	470Ω			

ITEM No.	RATING		OLYMPIC PART No.	NOTES
	OHMS	WATT		
R11	1000Ω			
R12	1000Ω			
R13	1500Ω			
R14	1800Ω			
R15	4700Ω	5		
R16	5600Ω	1		
R17	100Ω			Note 3
R18	100Ω			Note 4

Note 1. Some versions may use 4.7meg in this application.
Note 2. Some versions may use 3.3meg in this application.
Note 3. Some versions may use 47Ω 1W in this application.
Note 4. Not used in some versions.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		OLYMPIC PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick							
L2	Osc. Coil							
L3	Input IF							
L4	Output IF							

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	10K	12Ω	OPT-061							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	OLYMPIC PART No.	QUAM PART No.	
SP1	2½"	PM	12Ω		25A07Z12	

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	OLYMPIC PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.110A			SD-500	M-150		

BATTERIES

ITEM No.	VOLTAGE	OLYMPIC PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M2	1.5V		230		A100		M13R		
M3	67.5V			UX45		416		M217	

MISCELLANEOUS

ITEM No.	PART NAME	OLYMPIC PART No.	NOTES
M4	Tuning Cap		2 Gang
M5	Switch		AC-DC-Battery

CABINETS & CABINET PARTS

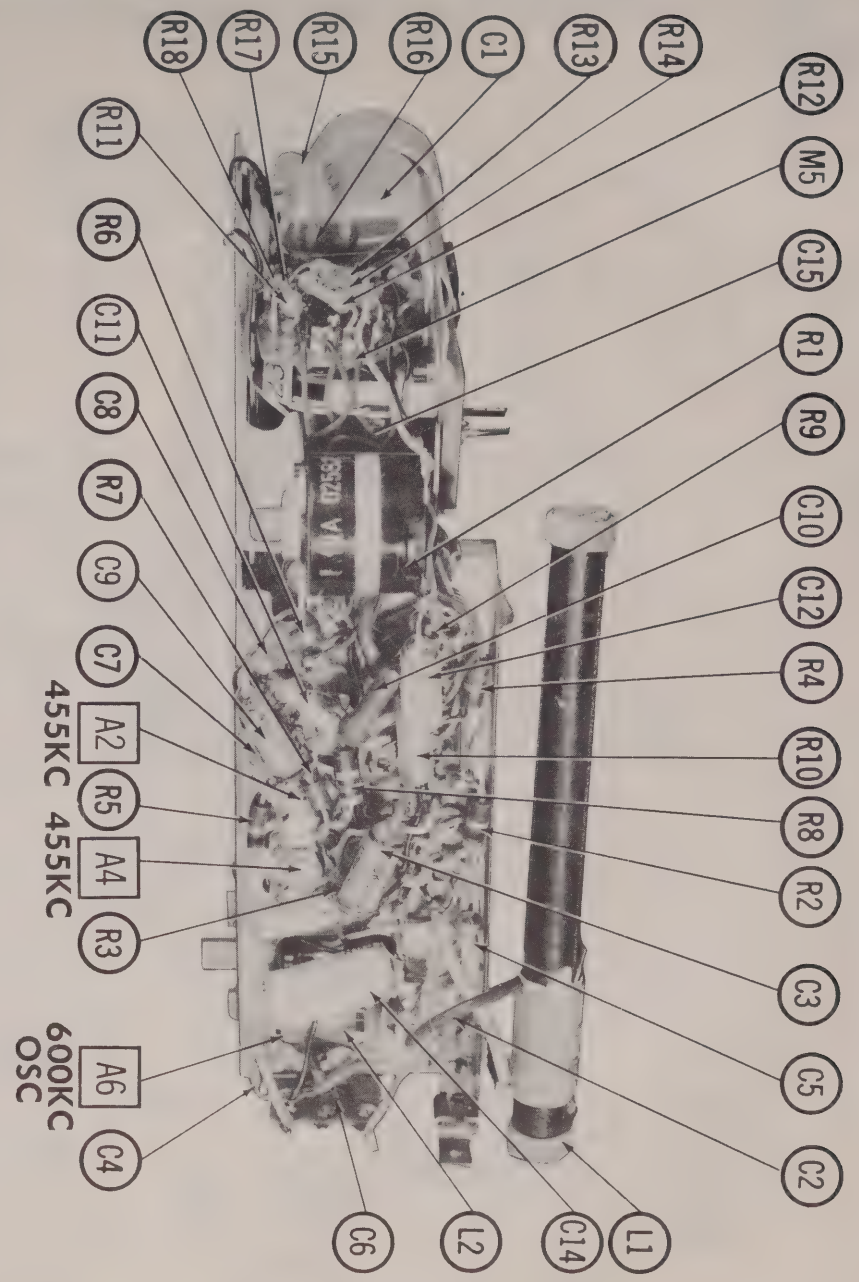
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

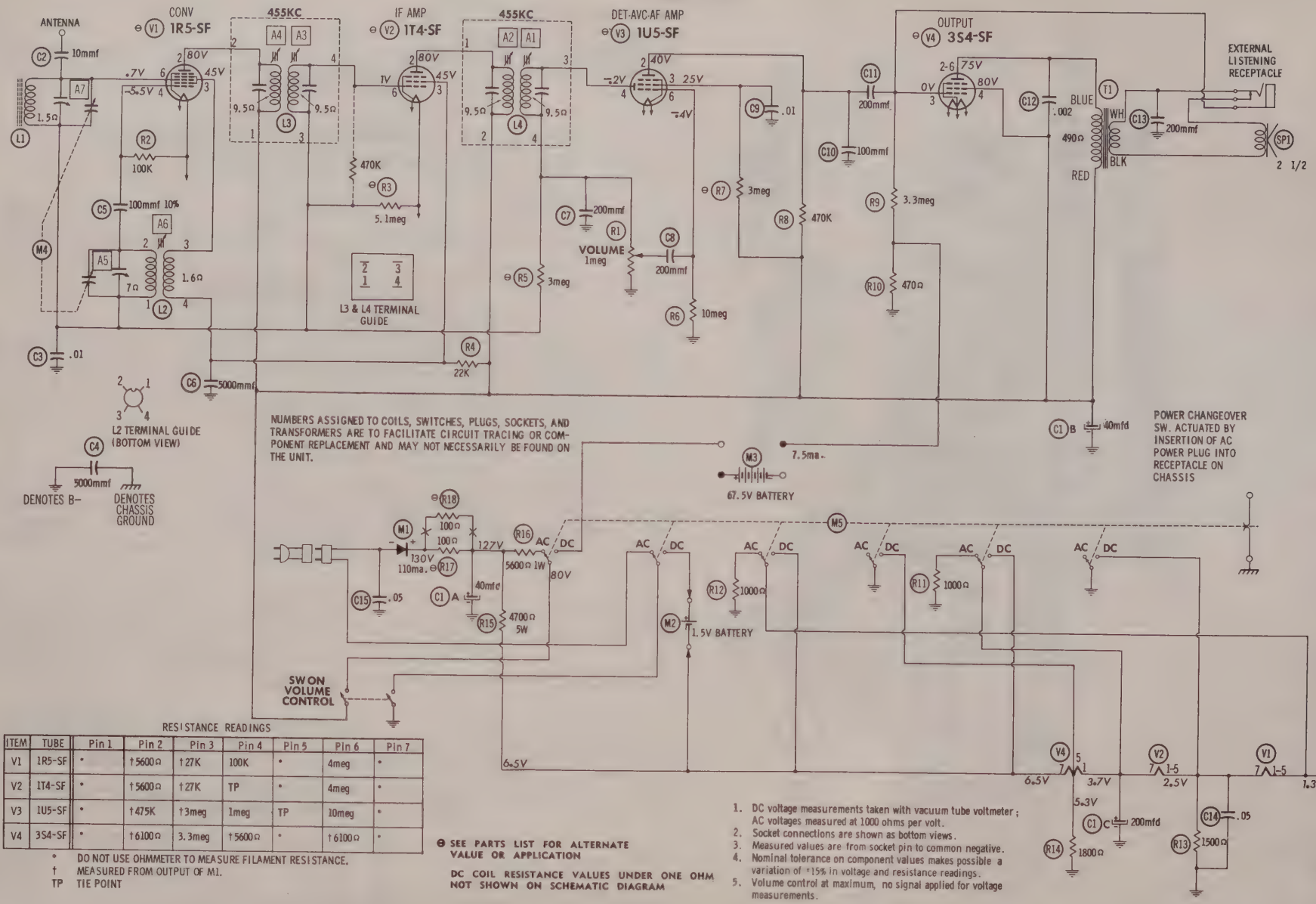
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

CHASSIS BOTTOM VIEW





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	1R5-SF	•	†5600Ω	†27K	100K	•	4meg	•
V2	1T4-SF	•	†5600Ω	†27K	TP	•	4meg	•
V3	1U5-SF	•	†475K	†3meg	1meg	TP	10meg	•
V4	3S4-SF	•	†6100Ω	3.3meg	†5600Ω	•	†6100Ω	•

• DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.
† MEASURED FROM OUTPUT OF M1.
TP TIE POINT

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

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OLYMPIC MODELS 460, 461

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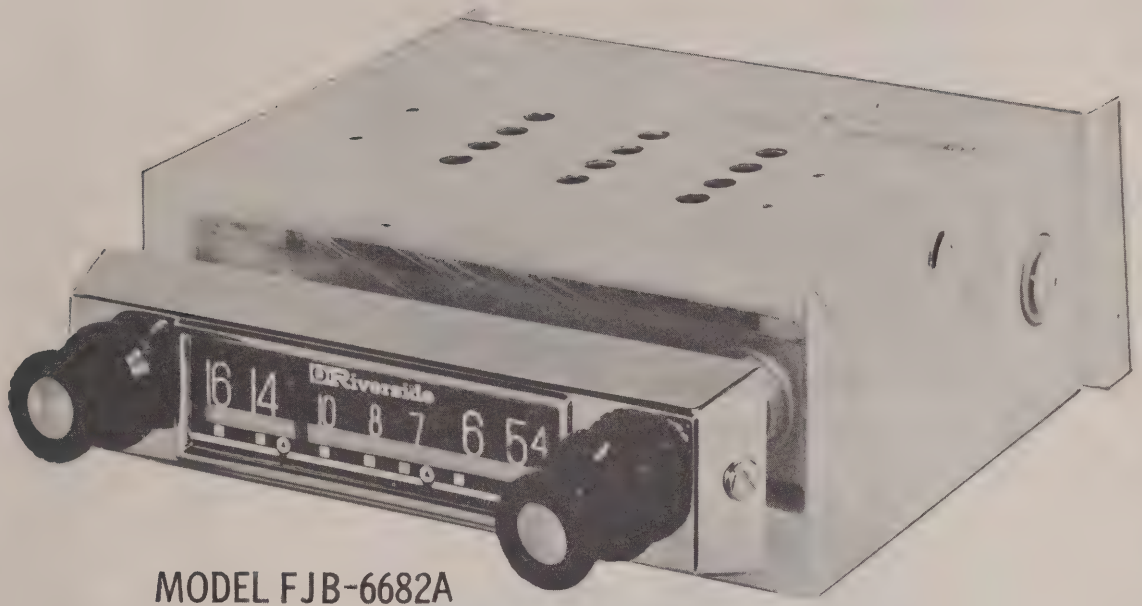
RIVERSIDE MODELS
FJB-6682A, B



MODEL FJB-6682A

RIVERSIDE MODELS
FJB-6682A, B

TRADE NAME	Riverside Models FJB-6682A, FJB-6682B
SUPPLIER	Montgomery Ward & Co., 619 Chicago Ave., Chicago, Illinois
TYPE SET	Battery Operated 4 Tube Universal Type AM Automobile Receiver With Transistorized Output
POWER SUPPLY	12 Volt Storage Battery
TUNING RANGE—BROADCAST	538-1610KC
RATING	3 Amp. @ 12.6 Volts DC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:
A1 thru A4..... GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545
A5 & A6..... GENERAL CEMENT #5000, 5003, 8276, 8290
WALSCO #2512, 2525

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to pin 7 (grid) of 12AD6 (V2). Low side to chassis.	265KC (Unmod.)	Low Freq. End	Across voice coil	A1, A2, A3, A4	Adjust for maximum deflection.
2.	"	"	1610KC	"	"	A5	"
3.	68mmf	High side to antenna terminal. Low side to chassis.	"	"	"	A6, A7	"
4.	With radio installed in car and antenna fully extended, tune to a weak station near 1400KC and adjust A7 for maximum volume.						

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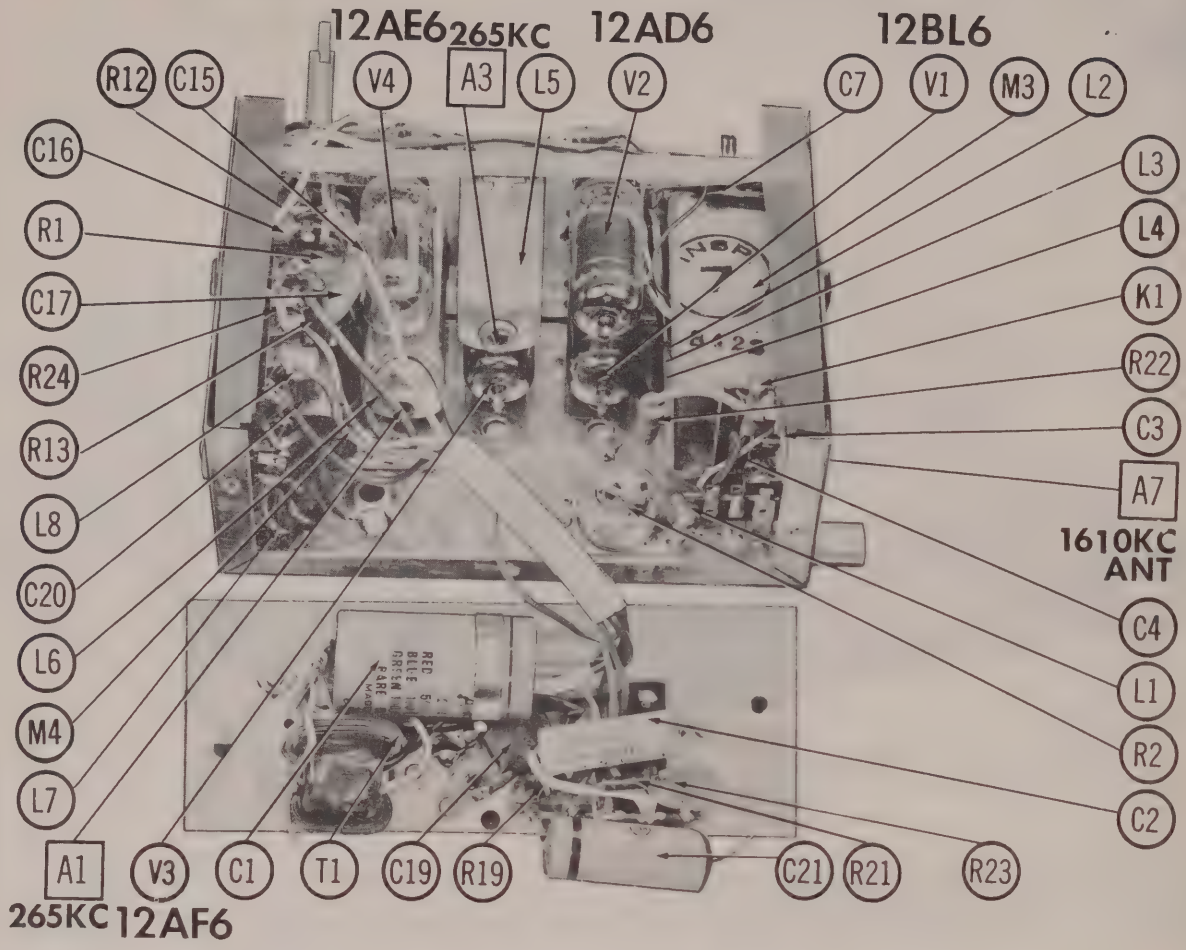
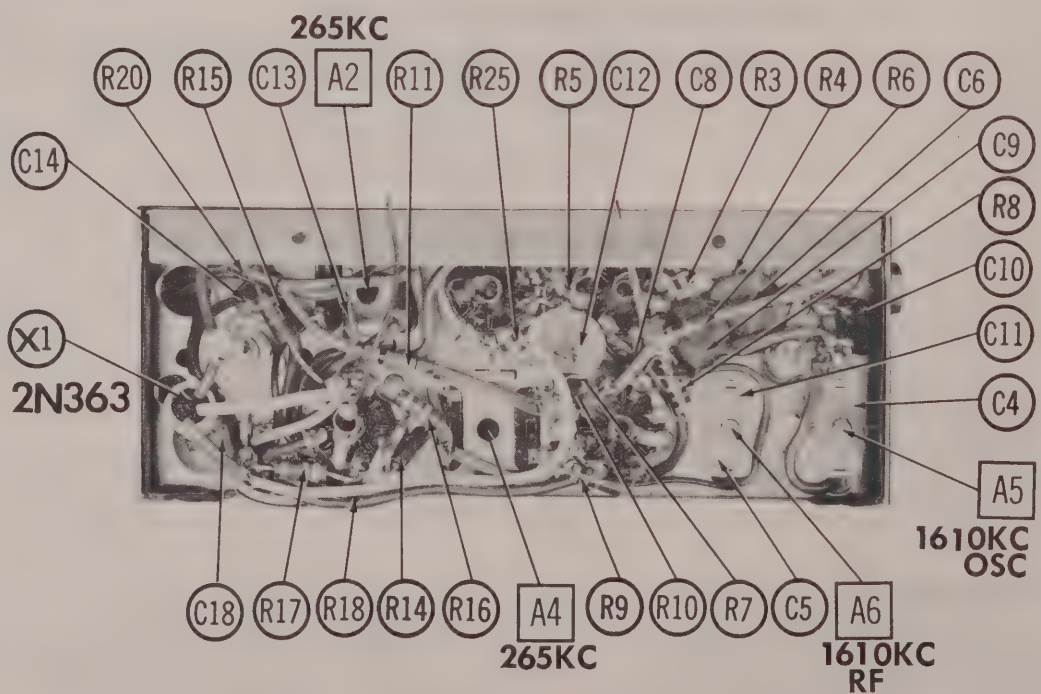
JD072

SET 455 FOLDER 15



CHASSIS - BOTTOM VIEW



CHASSIS - END VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	12BL6	①
V2	Converter	12AD6	
V3	IF Amplifier	12AF6	②③
V4	Det. -AVC-AF Amp.	12AE6	

① Some versions may use 12EZ6 or 12AF6 in this application.
② Some versions may use 12BL6 in this application.
③ Some versions may use 12FM6 or 12FK6 in this application.

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N363 †	Driver	LT-52		2N363	2N406	PNP
X2	1124A *	Output				2N242	PNP

† Alternate #1329
* Alternate #DT41

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	Riverside PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	500	15	20A963	PRS15V500100				TVAS-3392*	
B	100	15		100					
C	100	15							
C2	150	15		PRS50V150	BR1505	TC25015	TD-150-50	TVA-1311	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	Riverside PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3				28-800L						
C4	40		NPO		NPO-DI 39	TCZ-39	C10Q39C	CNO-439	5TCC-Q39	
C5				28-101						
C6	3000				DI-3000	DD-302	BYA10D3	B-227	5GA-D3	
C7	47000				BPD-05	DF-503			5HK-S5	
C8	12				DI-12	DD-120	L10Q12	CNO-412	5GA-Q12	①
C9	40		NPO		NPO-DI 39	TCZ-39	C10Q39C	CNO-439	5TCC-Q39	
C10	300			25-301S	1469-0003	DD-301	5R5T3	B-327	MS-330	
C11				28-161						
C12	10000			15-103	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C13	27				DI-27	DD-270	L10Q27	CNO-427	5GA-Q27	
C14	220			15-221	DI-220	DD-221	L10T22	B-322	5GA-T22	
C15	3000				DI-3000	DD-302	BYA10D3	B-227	5GA-D3	
C16	.01	600		15-103	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C17	.01	600		15-103	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C18	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	②
C19	3000				DI-3000	DD-302	BYA10D3	B-227	5GA-D3	
C20	.5	100		30-474-1	P288N-5		CUB2P5	GEM-205	2TM-P5	
C21	.5	100		30-474-1	P288N-5		CUB2P5	GEM-205	2TM-P5	

① Some version may use 27mmf in this application.
② Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESIST-ANCE	WATTS	Riverside PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2meg	½	80A960A①	F1-68		† QJ992	■ UE3994-3	Tone
B	1meg	½		R2-57				Volume, Tap ⓐ 160K
C	Shaft			AK-26				
D	Switch			KR-4				
R2	125Ω	2(ww)	62-502		39-125		FL-150	Bias Adjust

① Part #80A656 used in some versions.
† "Concentrikit" equivalent: K-2 Kit, with base elements and shafts: B13-139, P1-210 (Panel)
B13-137X, R1-223 (Rear)
S-4 (Adapter)
76-1 (Switch)

■ "STA-LOC" equivalent: FG26A, RU16T, OS2312, IS2750, US41

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		Riverside PART No.	NOTES
	OHMS	WATT		
R3	150K			
R4	1500Ω			
R5	330Ω			
R6	4.7meg			
R7	2.2meg			
R8	47K			
R9	330Ω			
R10	10meg			
R11	10meg			
R12	100K			
R13	820Ω			
R14	1.2meg			

ITEM No.	RATING		Riverside PART No.	NOTES
	OHMS	WATT		
R15	1.2meg			
R16	6800Ω			
R17	12K			
R18	150Ω			
R19	270K			
R20	220Ω			
R21	22Ω			
R22	270Ω	1		
R23	1Ω	1		
R24	470Ω			Note 1
R25	330Ω			

Note 1. Not used in Model FJB-6682A

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Riverside PART No.	REPLACEMENT DATA
K1	Ant. Input Isolation	100mmf, 1.2meg	89-4204	Sprague PRC-9

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		Riverside PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Ant. Coil	14-59						Wound on resistor † Part of M3
L2	Ant. Tuning Coil	†						
L3	RF Tuning Coil	†						
L4	Osc. Tuning Coil	†						
L5	Input IF	14-1655-6	16-6752	16-6752	BC-350	12-H1	RF-3	
L6	Output IF	14-1655-6	16-6752	16-6752	BC-351	12-H2	RF-3	
L7	"A" Lead Choke	14-205						

PARTS LIST AND DESCRIPTIONS (Continued)

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ∿)	Riverside PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L8	3A	.5Ω	.003 HY	75A6001						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Riverside PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	10:	1	75A1108①						① Model FJB-6682B only

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	Riverside PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	15Ω	3-4Ω	75A1106①							① Model FJB-6682B only (See SP1)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Riverside PART No.	QUAM PART No.	
SP1	10"x2 5/8"	PM	3-4Ω	73B9969① 73B972②		① Model FJB-6682B ② Model FJB-6682A includes T2

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Riverside PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	SFE	7½A 32V			30107.5 (SFE 7½ 32V)	155009	SFE 7½	HDH

MISCELLANEOUS

ITEM No.	PART NAME	Riverside PART No.	NOTES
M2	Lamp	1826	#12
M3	Tuner	78A950	
M4	Spark Plate	43-215	

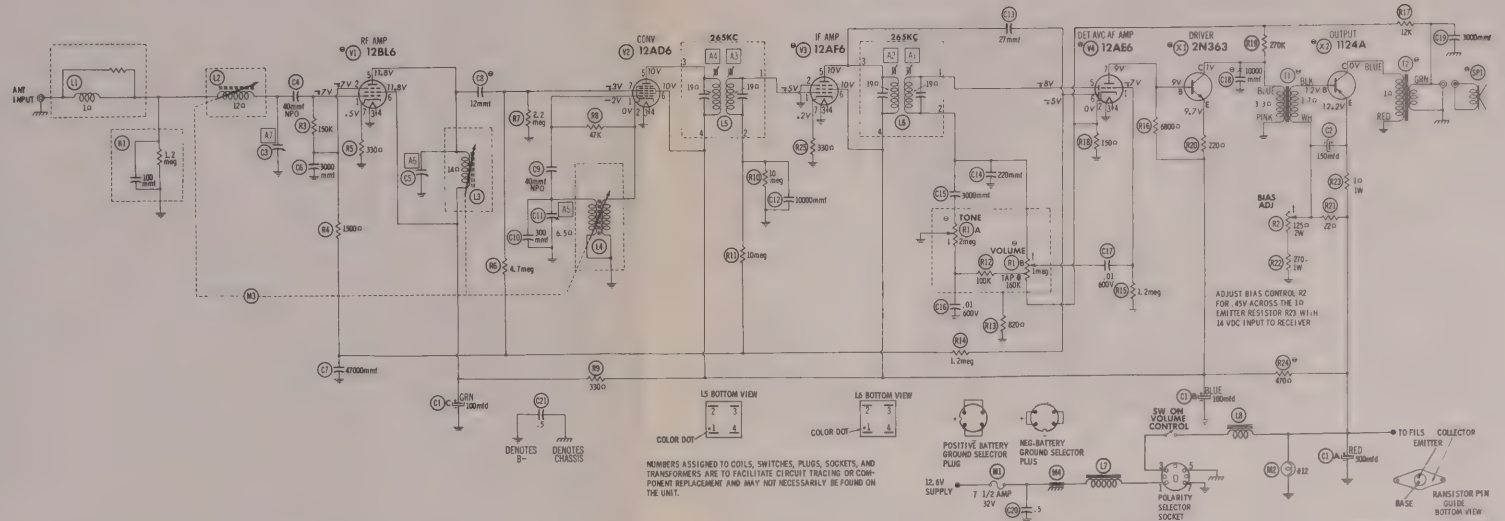
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	47B319-1	Tuning
Knob	47B319-2	Tuning
Knob	47B394	Tone
Knob	47B394-1	Dummy
Case	52C925	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire ..... Use BELDEN No. 8885
Bonding Strap ..... Use BELDEN No. 8661



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12BL6	5.5meg	5.4meg	0Ω	2.8Ω	†810Ω	†800Ω	330Ω		
V2	12AD6	47K	.5Ω	0Ω	2.8Ω	†490Ω	†470Ω	2.2meg		
V3	12AF6	7meg	0Ω	0Ω	2.8Ω	†490Ω	†470Ω	330Ω		
V4	12AE6	1.2meg	150Ω	0Ω	2.8Ω	1meg	7meg	†6500Ω		

TRANSISTOR CIRCUIT RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

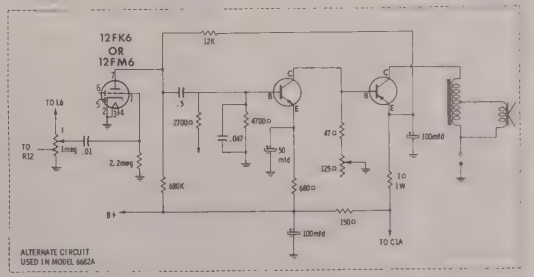
† MEASURED FROM POSITIVE TERMINAL OF C1A.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative
4. Battery voltage maintained at 12.6 volts for voltage readings
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)



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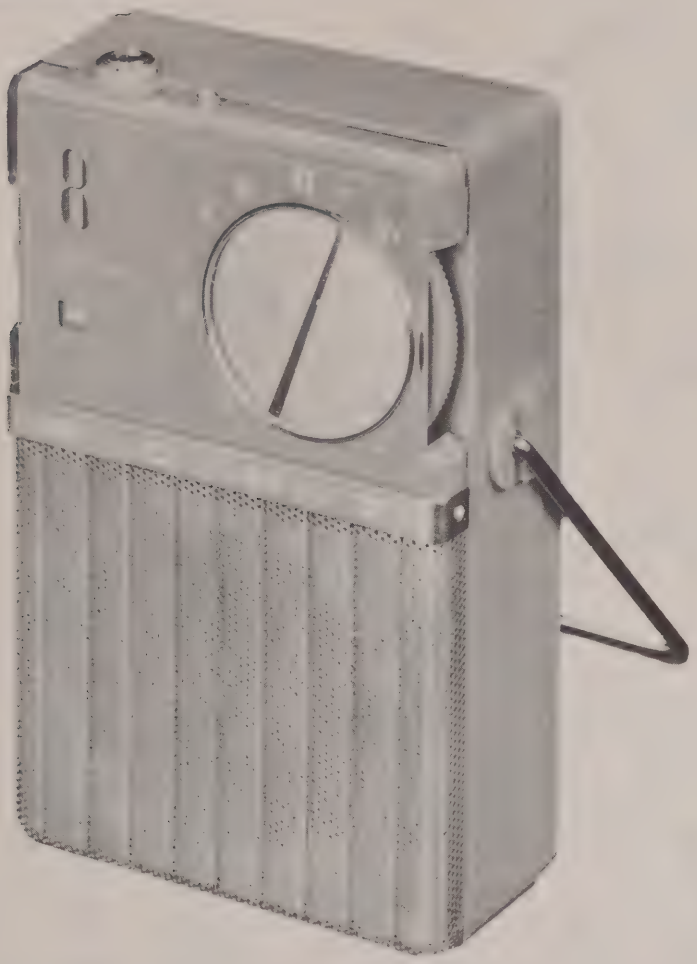
RIVERSIDE MODELS FJB-6682A, B

PHOTOFACT* Folder with CIRCUITRACE*

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

SONY MODEL TR-86

SONY MODEL TR-86



SONY MODEL TR-86

TRADE NAME	Sony Model TR-86		
IMPORTER	Delmonico International Corp., 42-24 Orchard Street, Long Island City 1, N. Y.		
TYPE SET	Battery Operated Portable Transistorized AM Receiver		
POWER SUPPLY	9 Volts DC	RATING	7.6MA @ 9 Volts DC (No Signal, Min. Volume)
TUNING RANGE—BROADCAST	535 - 1650KC		8.5MA @ 9 Volts DC (Signal, Normal Volume)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.		Loop	455KC (400~ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.		"	1650KC	"	"	A4	"
3.		"	600KC	600KC	"	A5	"
4.		"	1400KC	1400KC	"	A6	"

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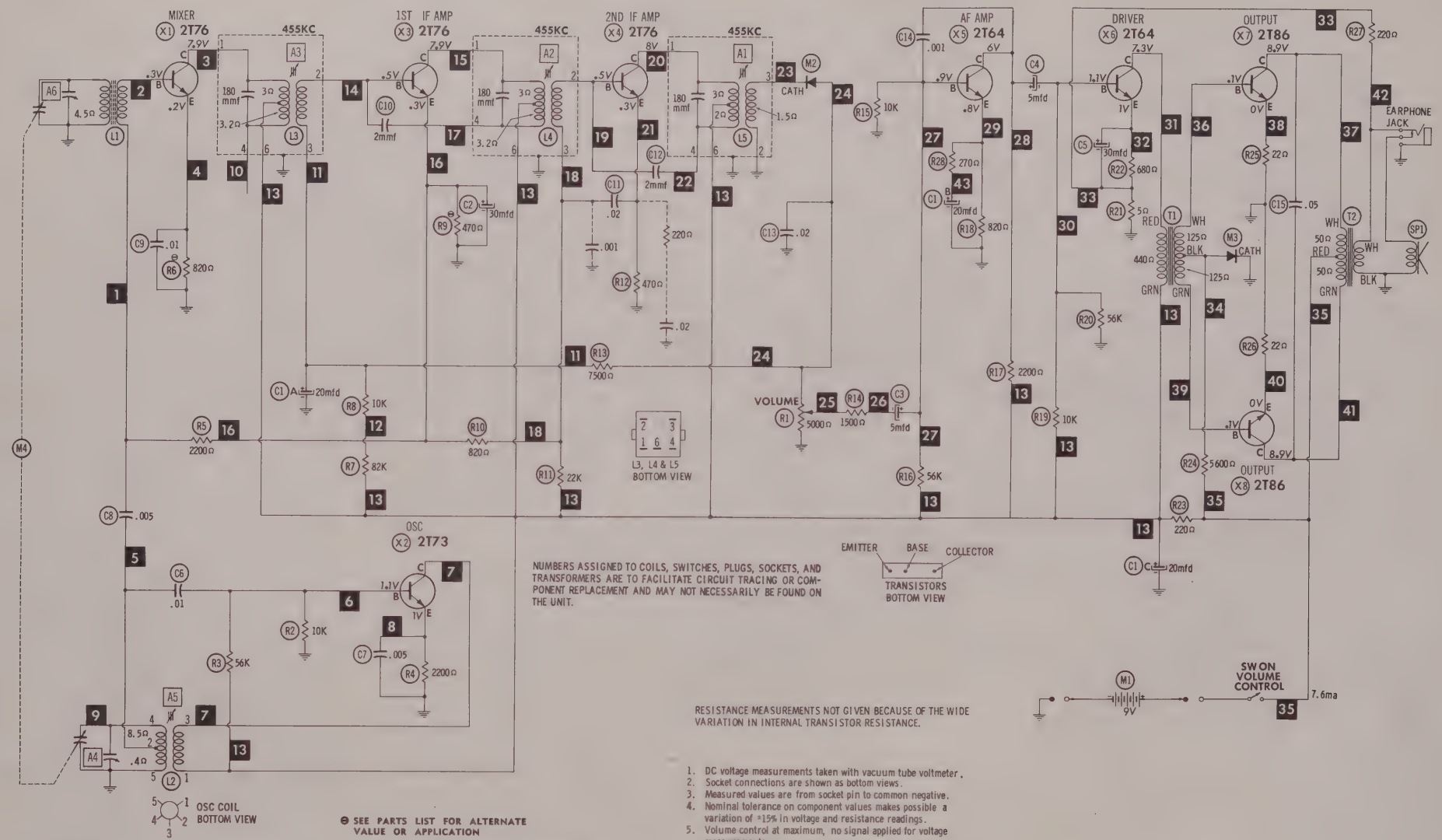

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

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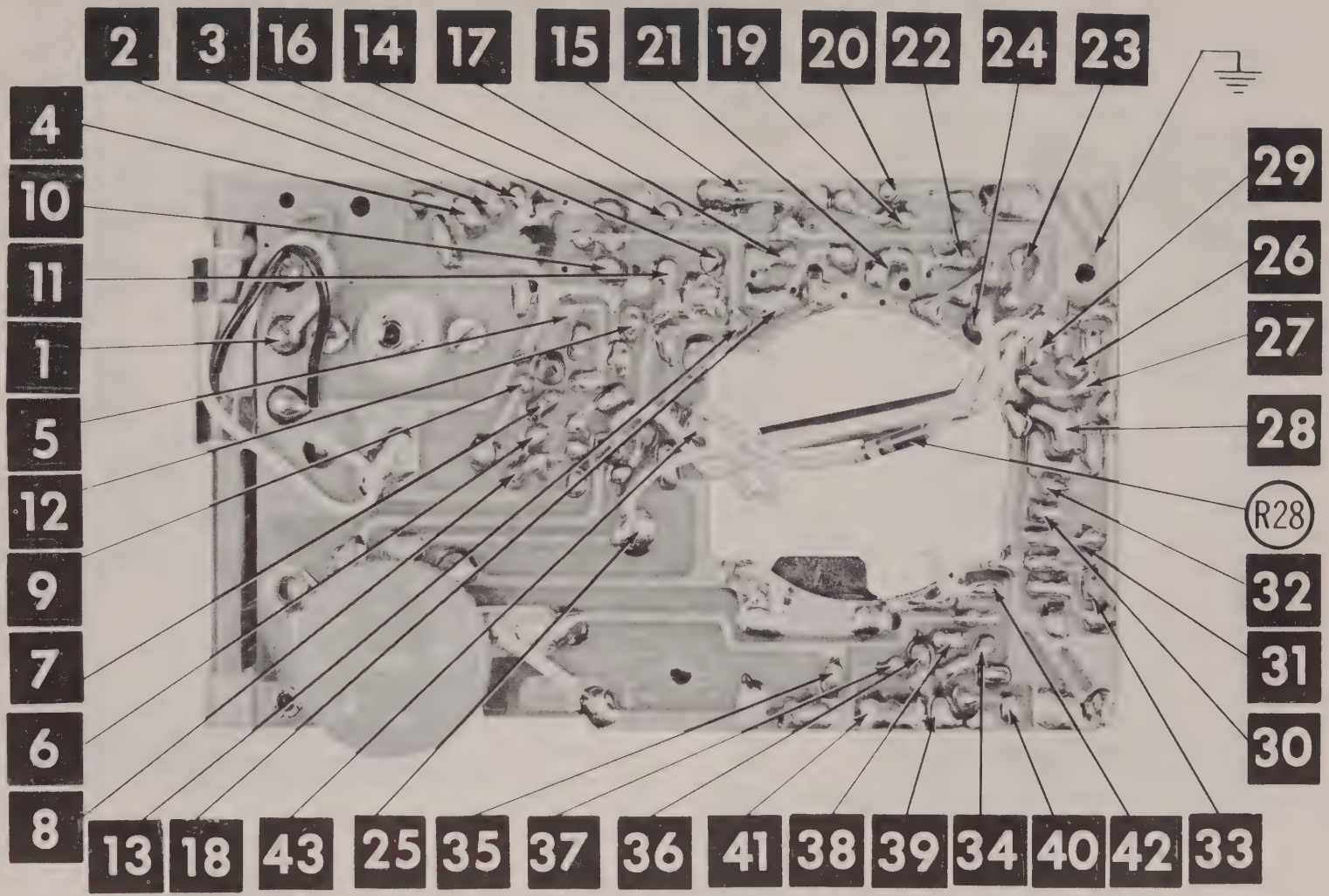
SONY MODEL TR-86



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PRINTED BOARD

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2T76	Mixer					NPN
X2	2T73	Oscillator					NPN
X3	2T76	1st IF Amplifier					NPN
X4	2T76	2nd IF Amplifier					NPN
X5	2T64	AF Amplifier					NPN
X6	2T64	Driver					NPN
X7	2T86	Output					NPN
X8	2T86	Output					NPN

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	SONY PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	20	10							
B	20	10							
C	20	10							
C2	30	3		XPP-3030	NLW30-6	TT3X25		TE-1056	
C3	5	6		XPP-6005	NLW5-15	TT6X5	ML5-6	TE-1084	
C4	5	6		XPP-6005	NLW5-15	TT6X5	ML5-6	TE-1084	
C5	30	3		XPP-3030	NLW30-6	TT3X25		TE-1056	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	SONY PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C6	.01	100			P285N-01	DM-103	H-05S1	BT-110	3GAB-S1	
C7	.005	100			P285N-005	DM-502	BYA10D5	BT-250	3GAB-D47	
C8	.005	100			P285N-005	DM-502	BYA10D5	BT-250	3GAB-D47	
C9	.01	100			P285N-01	DM-103	H-05S1	BT-110	3GAB-S1	
C10	2				NPO-SI 2	TCZ-2R2	C10V2C	CNO-522	5TCCB-V22	
C11	.02	100			P285N-02	DDM-203	H-05S2	BT-120	3GAB-S22	

CAPACITORS (cont)

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	SONY PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C12	2				NPO-SI 2	TCZ-2R2	C10V2C	CNO-522	5TCCB-V22	
C13	.02	100			P285N-02	DDM-203	H-05S2	BT-120	3GAB-S22	
C14	.001	100			P285N-001	DM-102	H-05D1	B-210	3GAB-D1	
C15	.05	100			P285N-05	DM-503	H-05S5	BT-150	3GAB-S47	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SONY PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	5000Ω	1/4	TR63-22					Volume and Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		SONY PART No.	NOTES
	OHMS	WATT		
R2	10K			
R3	56K			
R4	2200Ω			
R5	2200Ω			
R6	820Ω			Note 1
R7	82K			
R8	10K			Note 1
R9	470Ω			
R10	820Ω			
R11	22K			
R12	470Ω			
R13	7500Ω			
R14	1500Ω			
R15	10K			

ITEM No.	RATING		SONY PART No.	NOTES
	OHMS	WATT		
R16	56K			
R17	2200Ω			
R18	820Ω			
R19	10K			
R20	56K			
R21	5Ω			
R22	680Ω			
R23	220Ω			
R24	5600Ω			
R25	22Ω			
R26	22Ω			
R27	220Ω			
R28	270Ω			

Note 1. Values may vary, replace with original value.

PARTS LIST & DESCRIPTION (continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		SONY PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	TR63-14						
L2	Osc. Coil							
L3	1st IF Trans.	TR63-2						
L4	2nd IF Trans.	TR63-3						
L5	3rd IF Trans.	TR63-4						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SONY PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1	1	TR63-11						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	SONY PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	2200Ω CT	10Ω	TR63-10							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SONY PART No.	QUAM PART No.	
SP1	2 1/4"	PM	10Ω	TR63-1		

BATTERIES

ITEM No.	VOLTAGE	SONY PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	9V			2U6		216		TR-146R	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		SONY PART No.	CBS PART No.	SYLVANIA PART No.	
M2		TR63-16	1N60	1N295	Detector (Pigtail)
M3		TR63-16	1N60	1N295	Bias (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	SONY PART No.	NOTES
M4	Tuning Cap.	TR63-5	

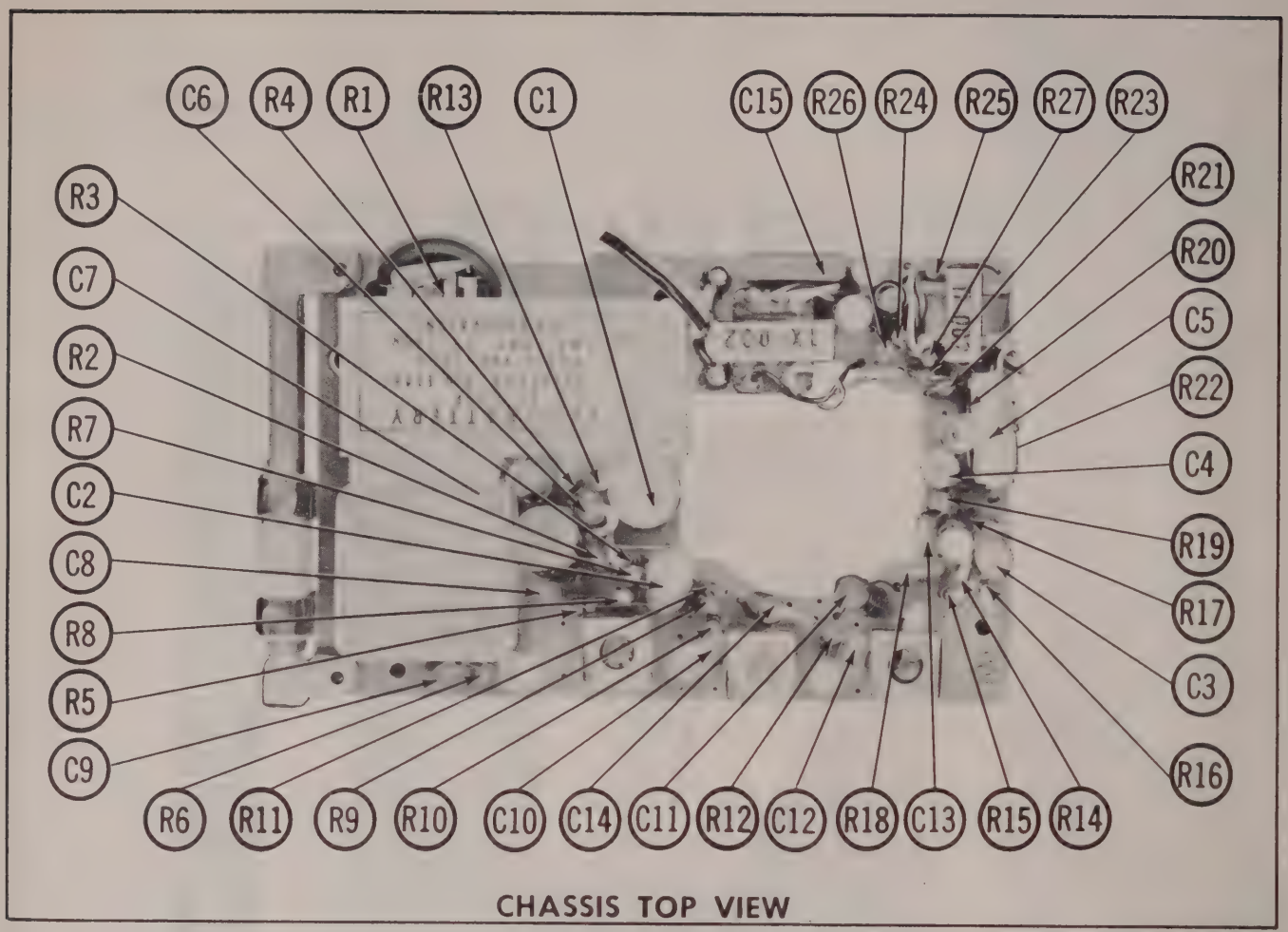
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

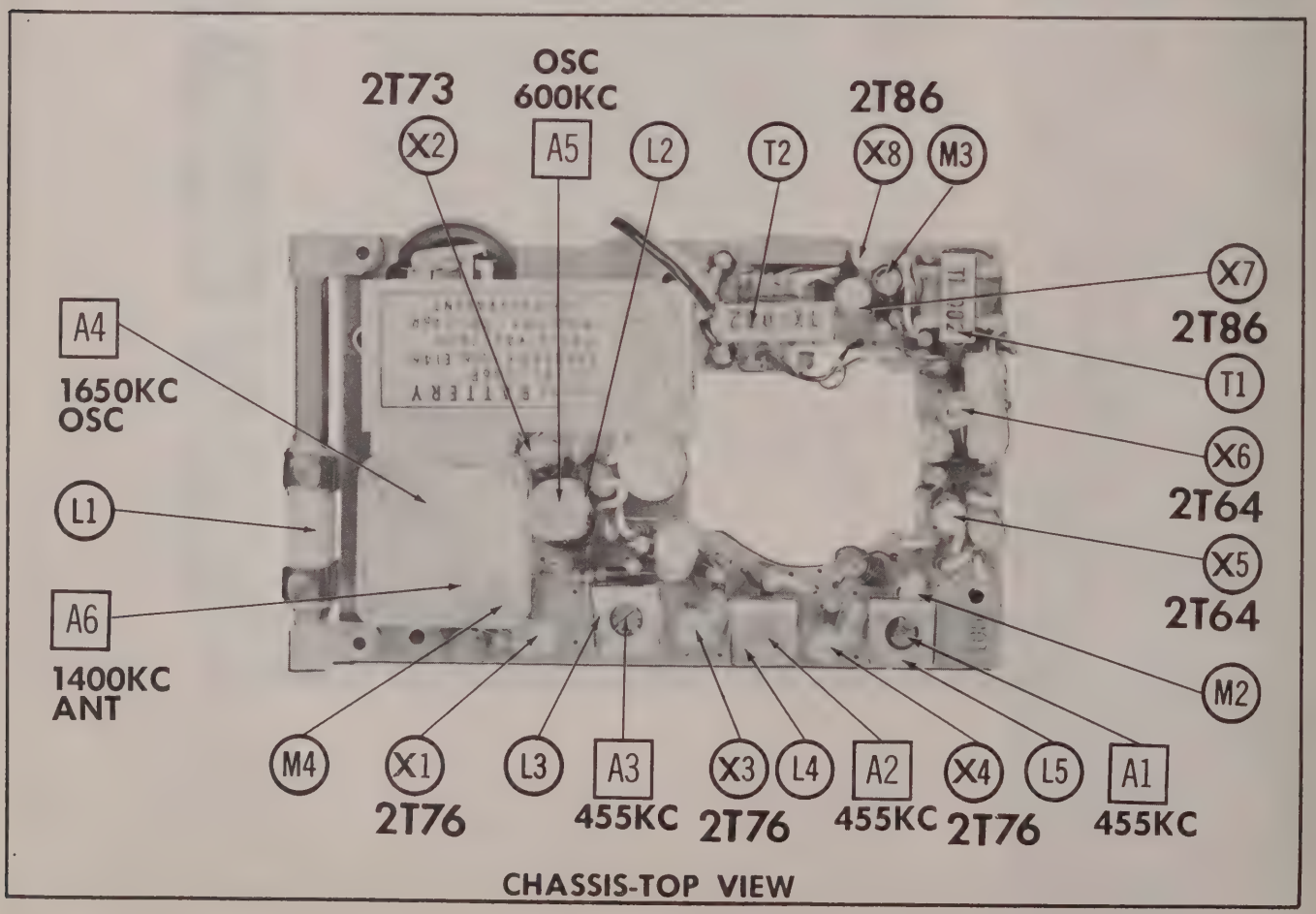
NAME	PART NO.	DESCRIPTION
Knob	TR63-8	Tuning
Knob	TR63-7	Volume
Cabinet	TR63-9	

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors



CHASSIS TOP VIEW



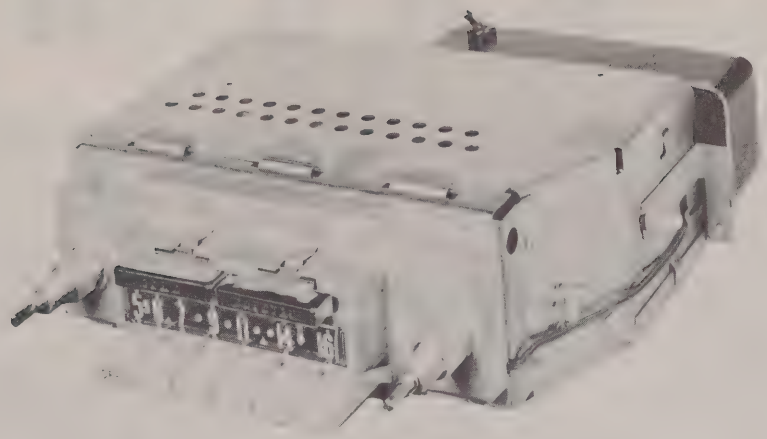
CHASSIS-TOP VIEW

PHOTOFACT* Folder with CIRCUITRACE*

EIA MEMBER

**STROMBERG-CARLSON
MODEL C.A.R. 9**

STROMBERG-CARLSON
MODEL C.A.R. 9



TRADE NAME	Stromberg-Carlson Model C.A.R. 9 (For 1959 Edsel or 1959 Ford Automobiles)
MANUFACTURER	Stromberg-Carlson Co., Special Products Div., 1400 N. Goodman St., Rochester 9, N. Y.
TYPE SET	Battery Operated Custom Built 7 Tube AM Automobile Receiver With Transistorized Output
POWER SUPPLY	12 Volt Storage Battery
RATING	2.1 Amp. @ 12.6 Volts DC (2.6 Amp. When Tuning)
TUNING RANGE—BROADCAST	540 — 1610KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:
A1 thru A4..... GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545
A5, A6..... GENERAL CEMENT #5000, 5003, 8276, 8290
WALSCO #2512, 2525
A7, A8, A9..... GENERAL CEMENT #8607, 9291
WALSCO #2520, 2522, 2523, 2524, 2537

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to pin 7 (grid) of Converter. Low side to chassis.	262.5KC (400∿ Mod.)	High Freq. end stop	USE VTVM. DC probe thru 22meg to point (A). Common to chassis.	A1, A2, A3	Adjust for maximum deflection.
2.	"	"	"	"	"	A4	Adjust for MINIMUM deflection.
3.	Fig. 1	Thru dummy to antenna receptacle.	1610KC	"	Across voice coil.	A5, A6	Adjust for maximum output.
	Step 4 is not necessary unless tuner has been tampered with or associated components have been replaced. Repeat Step 3.						
4.	Fig. 1	Thru dummy to antenna receptacle.	1000KC	Tuner carriage ½" from high freq. end stop.	Across voice coil.	A7, A8, A9	Adjust for maximum output. Repeat Steps 3 & 4.
5.	"	"	1400KC	1400KC	"	A10	Adjust for maximum output.

PUSHBUTTON ADJUSTMENT

1. Pull pushbutton out.
2. Tune manually to desired station.
3. Press button in firmly.
4. Repeat for remaining buttons.

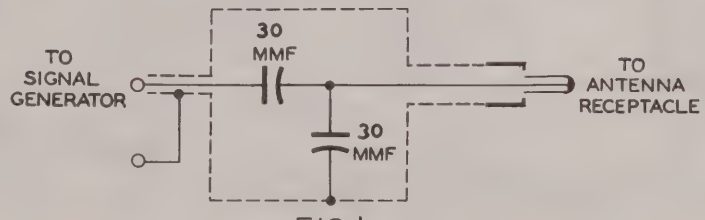


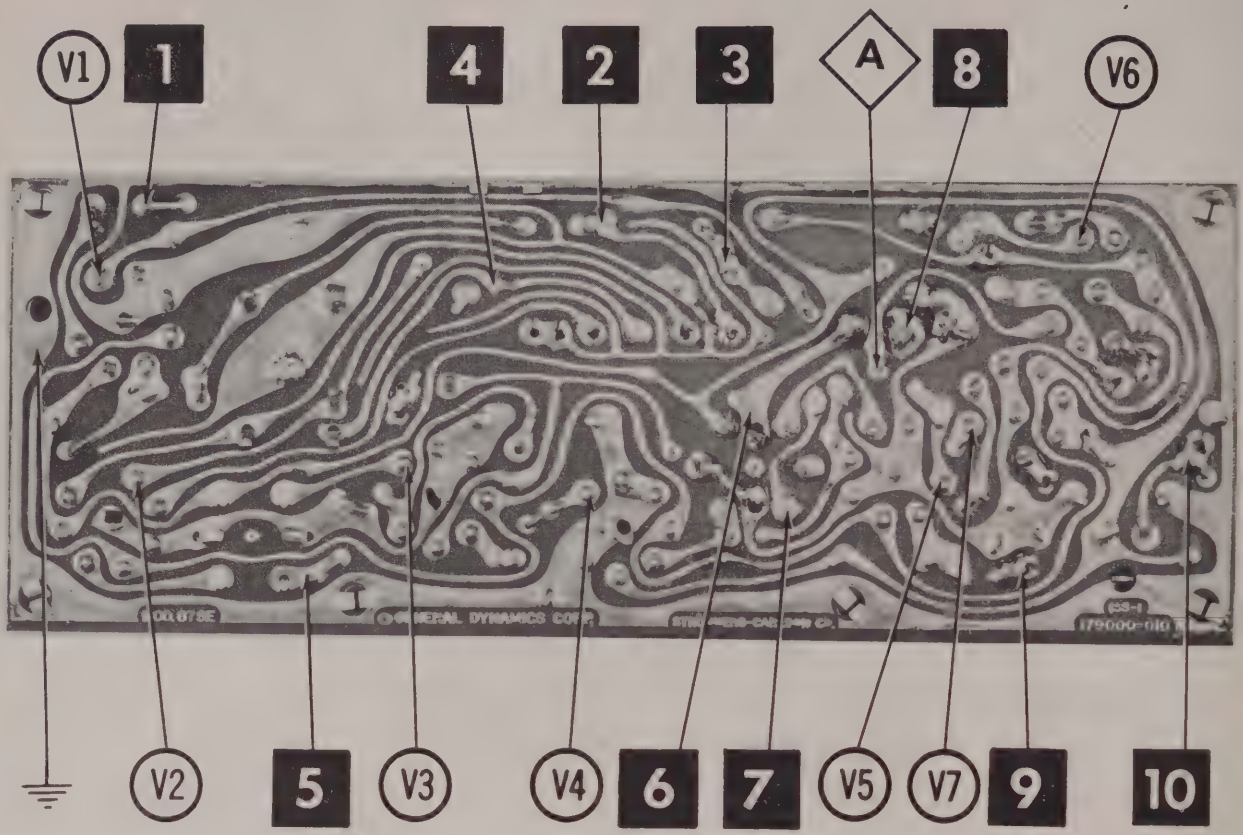
FIG. 1

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

JD28l

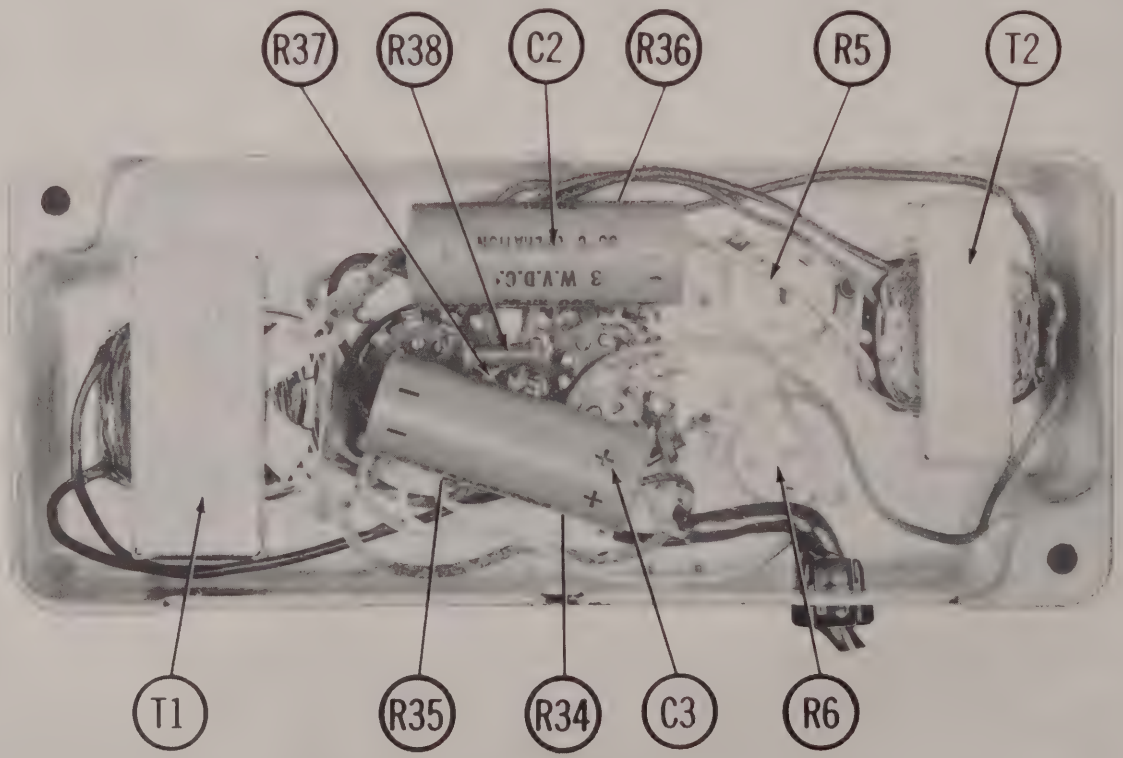
SET 455 FOLDER 17



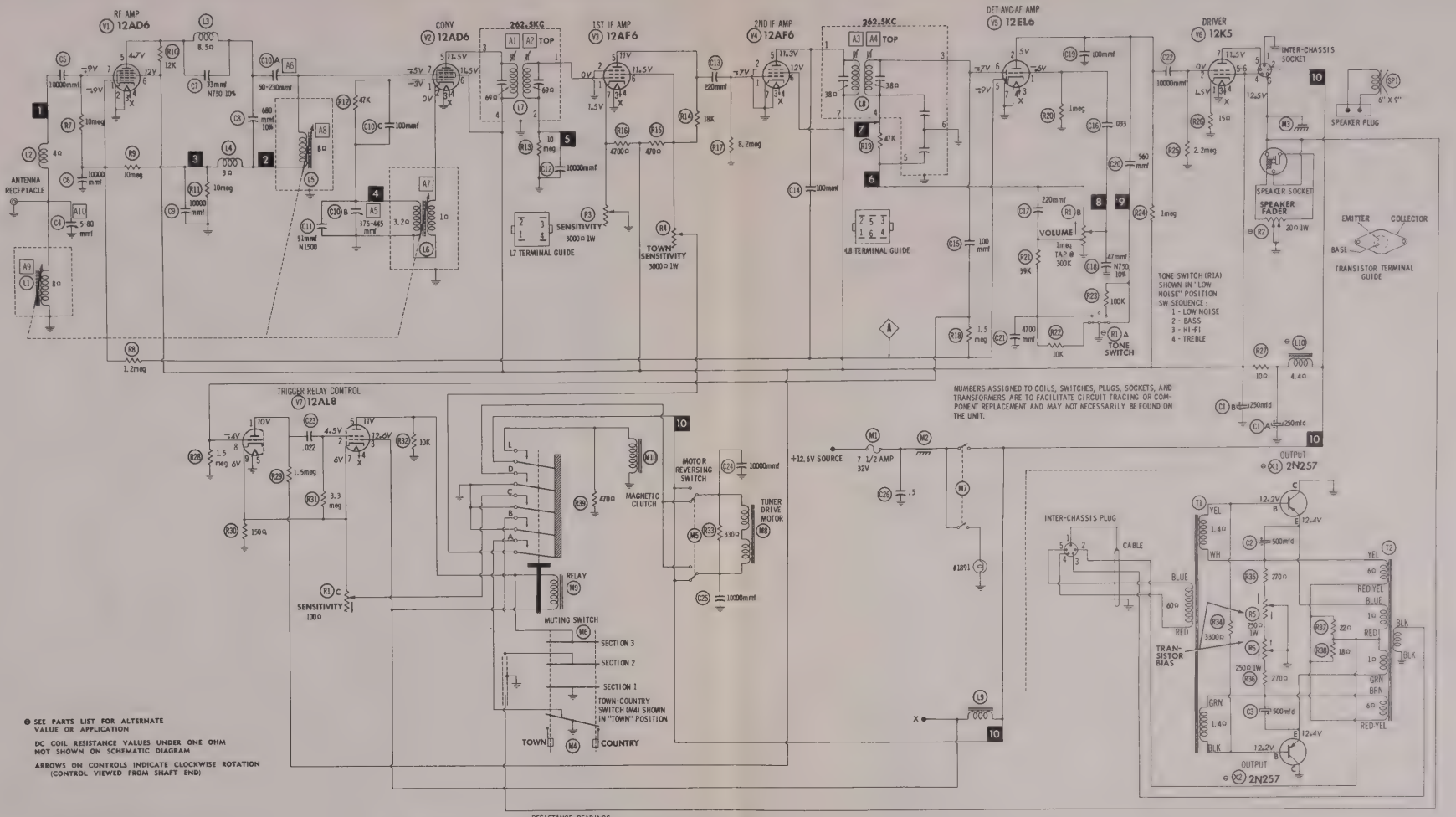
A Howard W. Sams CIRCUITRACE* Photo

PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



POWER CHASSIS — BOTTOM VIEW



● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AD6	4meg	0Ω	0Ω	1.2Ω	↑12K	↑10Ω	18meg		
V2	12AD6	47K	1Ω	0Ω	1.2Ω	↑80Ω	↑10Ω	7meg		
V3	12AF6	10meg	0Ω	0Ω	1.2Ω	↑20K	↑480Ω	750Ω		
V4	12AF6	8.2meg	0Ω	0Ω	1.2Ω	↑50Ω	↑10Ω	0Ω		
V5	12EL6	1meg	↑1meg	1.2Ω	0Ω	3.3meg	1meg	0Ω		
V6	12K5	15Ω	2.2meg	0Ω	1.2Ω	↑10Ω	↑10Ω	↑70Ω		
V7	12AL8	↑1.5meg	3.3meg	↑.2Ω	1.2Ω	0Ω	↑170Ω	120Ω	1.5meg	120Ω

TRANSISTOR CIRCUIT RESISTANCE NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.
↑ MEASURED FROM JUNCTION OF R27 AND L10.

TRANSISTOR BIAS ADJUSTMENT (R5-R6)

1. Connect a DC VTVM across the primary of output transformer T2 (Pin 9 of each transistor socket).
2. Connect a DC ammeter in series with input voltage source of 14.4VDC. Connect positive lead of source to pin 2 of output chassis plug, negative to chassis.
3. Adjust R5 and R6 for zero volt on VTVM and 1 Amp on ammeter. If the unit will not draw 1A, both transistors are weak. If the unit will draw 1 Amp but will not balance for zero volts, that transistor associated with the fully CW control is weak.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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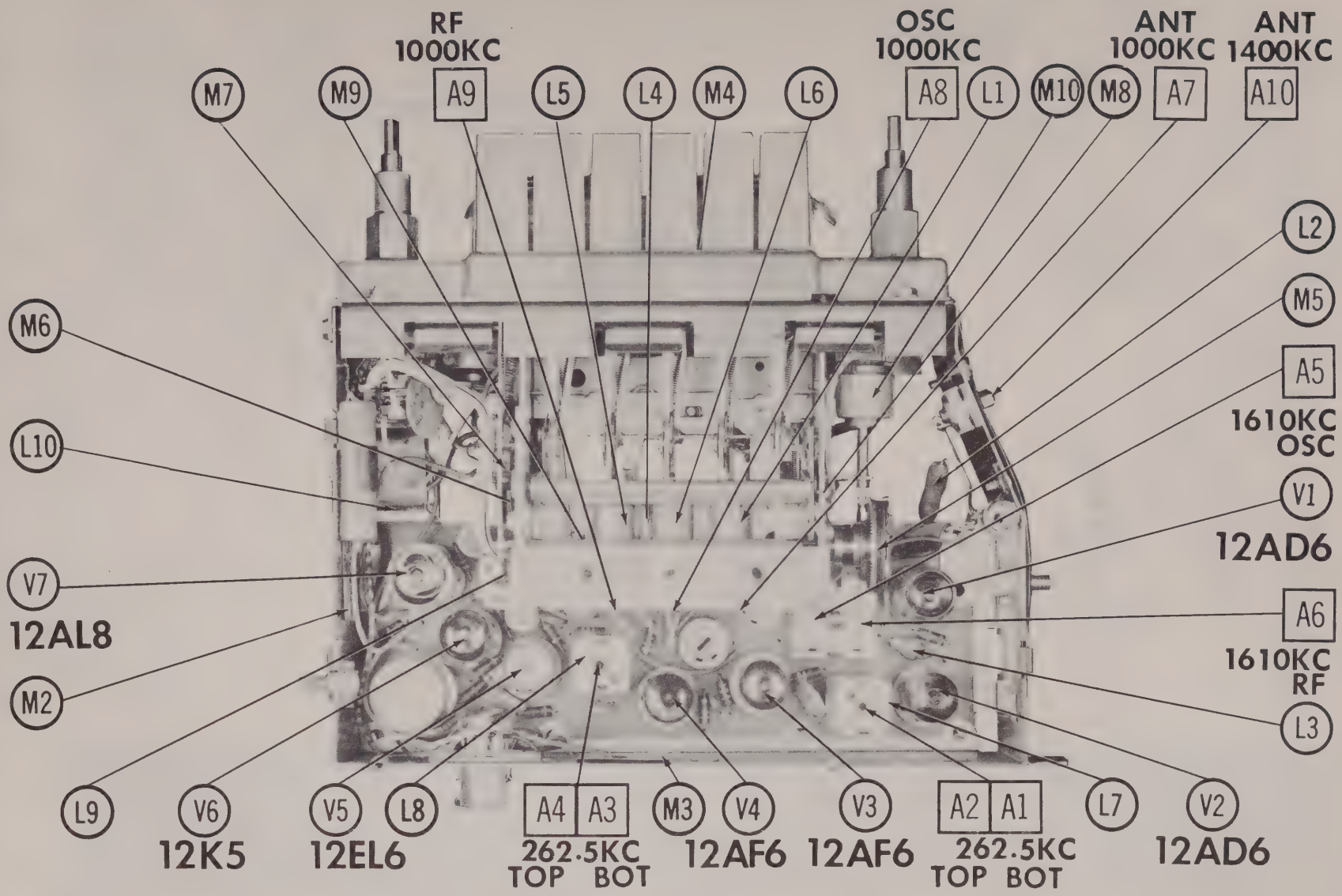
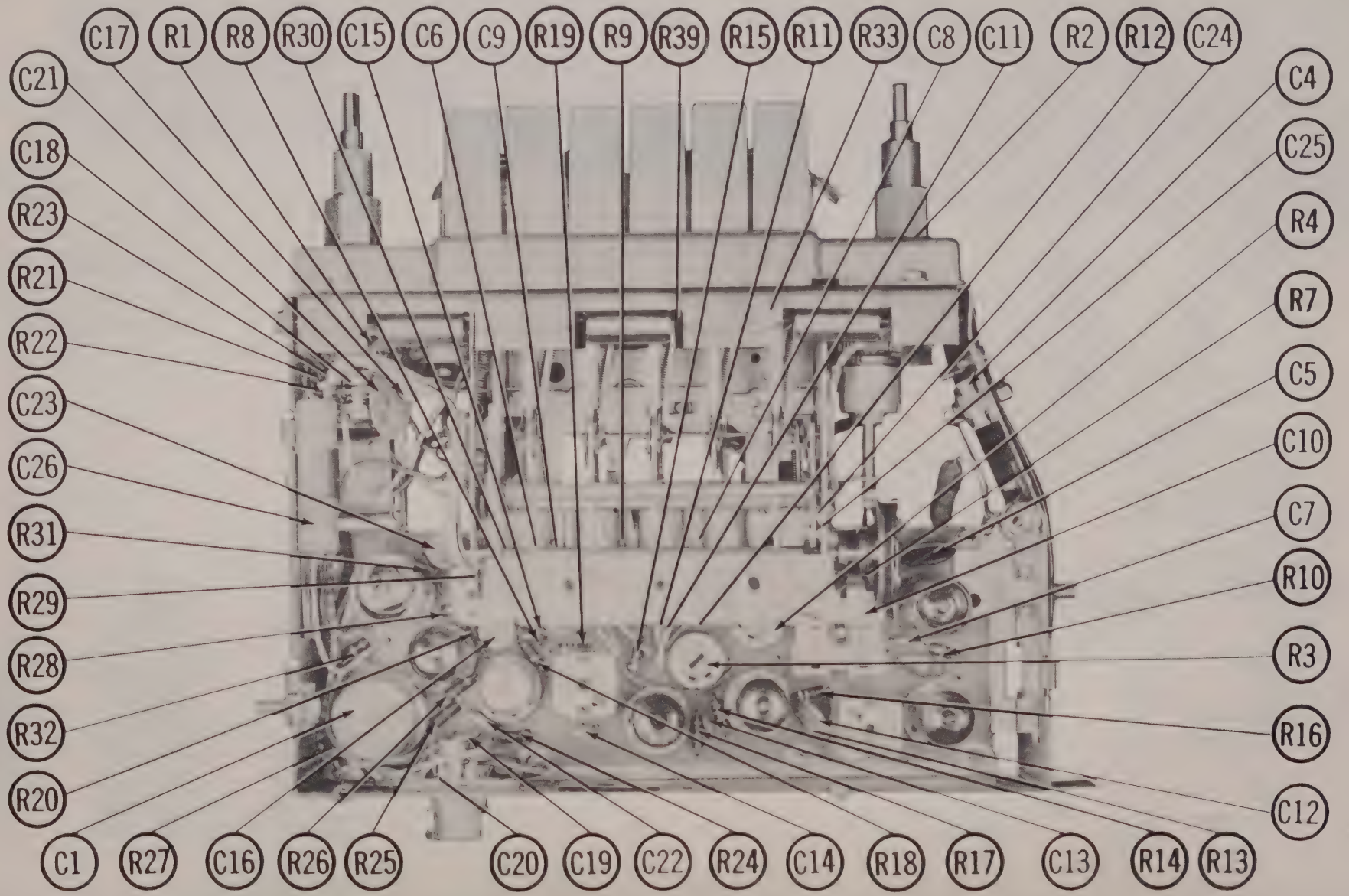
STROMBERG-CARLSON MODEL C.A.R. 9



CHASSIS — TOP VIEW

MODEL C.A.R. 9

STROMBERG-CARLSON



CHASSIS — TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	12AD6	
V2	Converter	12AD6	
V3	1st IF Amplifier	12AF6	
V4	2nd IF Amplifier	12AF6	

ITEM No.	USE	TYPE	NOTES
V5	Det. -AVC-AF Amp.	12EL6	
V6	Driver	12K5	
V7	Trigger-Relay Control	12AL8	

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N257 *	Output	2N155			2N257	PNP
X2	2N257 *	Output	2N155			2N257	PNP

* Alternate type 2N155

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	Stromberg-Carlson PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	250	16	111001-003	AFH3-00-80		PWP200.3		PCL-2170	
B	250	16							
C2	500	3	111001-004	PRS6V500	BR500-6	TC305	TD-500-6	TVA-1103	
C3	500	3	111001-004	PRS6V500	BR500-6	TC305	TD-500-6	TVA-1103	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	Stromberg-Carlson PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C4	5-80			110000-001						
C5	10000			110002-026	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C6	10000			110919-000	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C7	33		N750 10%	110002-051	N750-DI 33	DTN-33	C10Q33U	CN7-433	5TCU-Q33S 10%*	
C8	680		10%	110915-000	1464-00068	D6-681	1R5T68	JL-368	MS-368	
C9	10000			110002-026	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C10A	50-230			110000-010						
B	375-445									
C	100									
C11	51		N1500	110918-000						
C12	10000			110002-026	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C13	220			110002-042	BPD-00022	DD-221	L10T22	B-322	5GA-T22	
C14	100			110002-040	BPD-0001	DD-101	L10T1	UC-531	5GA-T1	
C15	100			110002-040	BPD-0001	DD-101	L10T1	UC-531	5GA-T1	
C16	.033	200		110003-002	P2151N-033	DF-303	BC2S33J	ACE6133	2SE-S33	
C17	220			110921-000	BPD-00022	DD-221	L10T22	B-322	5GA-T22	
C18	47		N750 10%	110917-000	N750-DI 47	DTN-47	C10Q47U	CN7-447	5TCU-Q47S 10%*	
C19	100			110002-040	BPD-0001	DD-101	L10T1	UC-531	5GA-T1	
C20	560			110002-056	BPD-00056	DD-561	L10T56	B-356	5GA-T56	
C21	4700			110920-000	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C22	10000			110919-000	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C23	.022	200		110003-001	P2151N-022		BC2S22J	ACE6122	2SE-S22	
C24	10000			110628-000	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C25	10000			110672-000	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C26	.5	50		110628-000	P288N-5		CUB2P5	GEM-205	2TM-P5	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Stromberg-Carlson PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	Switch		145000-002					Tone Note 1
B	1meg	½						Volume, Tap @ 300K
C	100Ω	½						Sensitivity
R2	20Ω	1(WW)	145000-010					Speaker Fader Note 2
R3	3000Ω	1(WW)	145000-030				PFL3K	Sensitivity
R4	3000Ω	1(WW)	145000-030				PFL3K	Town Sensitivity
R5	250Ω	1(WW)	145000-020		39-300		FL-250	Transistor Bias
R6	250Ω	1(WW)	145000-020		39-300		FL-250	Transistor Bias

Note 1. Some versions may use Part #145000-007
Note 2. Some versions may use Part #145000-008

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		Stromberg-Carlson PART No.	NOTES
	OHMS	WATT		
R7	10meg		554002-106	
R8	1.2meg		554001-125	
R9	10meg		554001-106	
R10	12K		554001-123	
R11	10meg		554001-106	
R12	47K		554002-473	
R13	10meg		554002-106	
R14	18K		554001-183	
R15	470Ω		554002-471	
R16	4700Ω		554002-472	
R17	8.2meg		554001-825	
R18	1.5meg		554001-155	
R19	47K		554002-473	
R20	1meg		554002-105	
R21	39K		554001-393	
R22	10K		554001-103	
R23	100K		554002-104	

ITEM No.	RATING		Stromberg-Carlson PART No.	NOTES
	OHMS	WATT		
R24	1meg		554002-105	
R25	2.2meg		554002-225	
R26	15Ω		554001-150	
R27	10Ω		554001-100	
R28	1.5meg		554001-155	
R29	1.5meg		554001-155	
R30	150Ω		554002-151	
R31	3.3meg		554002-335	
R32	10K		554002-103	
R33	330Ω		554002-331	
R34	3300Ω		554002-332	
R35	270Ω		554002-271	
R36	270Ω		554002-271	
R37	22Ω		554002-220	
R38	18Ω		149559-000	Temp. Comp.
R39	470Ω		554002-471	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		Stromberg-Carlson PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Ant. Coil							
L2	RF Choke	114000-002						32uh
L3	RF Choke	114000-004						
L4	RF Choke	114000-003						
L5	RF Coil							
L6	Osc. Coil							
L7	Input IF Trans.	114000-020						
L8	Output IF Trans.	114000-040						
L9	Fil. Choke	114000-001						

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ~)	Stromberg-Carlson PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L10	.068A	4.4Ω	.09 HY	161000-002①						

① Alternate Part #114000-002

STROMBERG-CARLSON
MODEL C.A.R. 9

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Stromberg-Carlson PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	9	1	161000-010						
		SEC. 2							
	9	1							

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI. 1	SEC.	Stromberg-Carlson PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	35Ω CT	3-4Ω	161000-020							
	PRI. 2									
	35Ω CT									

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Stromberg-Carlson PART No.	QUAM PART No.	
SP1	6"x 9"	PM	3-4Ω		69A3	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Stromberg-Carlson PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	SFE	7½A 32V		128000-001	30107.5 (SFE7½ 32V)	155009	SFE 7½	HHH

MISCELLANEOUS

ITEM No.	PART NAME	Stromberg-Carlson PART No.	NOTES
M2	Spark Plate	110000-021	
M3	Spark Plate	110000-022	
M4	Switch Ass'y.	158000-020	Town -Country
M5	Switch Ass'y.		Motor Reversing
M6	Switch Ass'y.		Muting
M7	Switch Ass'y.	171000-168	Off-On (Stack Pole Type A-21) DPST
M8	Motor	171000-172	Tuner Drive
M9	Relay	172000-010	
M10	Clutch Ass'y.	171000-171	Magnetic (635041)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Pushbutton Ass'y.	171000-013	Town
Pushbutton Ass'y.	171000-014	Country
Pushbutton	107000-003	Left Hand, Grey
Pushbutton	107007-007	Right Hand, Grey
Pushbutton	107000-011	Grey
Pushbutton	107000-004	Left Hand, White
Pushbutton	107000-008	Right Hand, White
Pushbutton	107000-012	White
Dial	122000-002	
Pointer Arm Ass'y.	144000-001	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire ..... Use BELDEN No. 8885
Bonding Strap ..... Use BELDEN No. 8661

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

TRUETONE MODELS DC5930A, B, C

TRUETONE MODELS
DC5930A, B, C

MODEL DC5930C

TRUETONE MODELS
DC5930A, B, C

TRADE NAME	Truetone Model DC5930A, DC5930B, DC5930C
SUPPLIER	Western Auto Supply Co., 2107 Grand Ave, Kansas City 8, Missouri
TYPE SET	AC Operated 4 Tube Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	105-125 Volts AC, 60 Cycles RATING 38 Watts, .43 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER PART #28A219 — SEE SIMILAR V-M 1201 — PHOTOFACT SET 436 FOLDER 18

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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JS194

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amplifier	12AV6	
V2	Phase Inverter	12AV6	

ITEM No.	USE	TYPE	NOTES
V3	Output	50L6GT	
V4	Output	50L6GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	TRUETONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▬80	150	45X448	AFH3-146	D0010	FP370	TMT-13	TVLS-3444.1*	
B	■40	150							
C	▲10	150							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA							NOTES
	CAP.	VOLT	TOL	TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.		
C2	.047	400		RCP10M4473M	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47		
C3	.047	400		RCP10M4473M	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47		
C4	.0022	400		RCP10M4222M	P488N-0022	DD-222	CUB6D22	GTM4222	6TM-D22		
C5	10		NPO 10%	47X674	NPO-SI 10	TCZ-10	C10V10C	CNO-410	5TCC-Q1S 10%*		
C6	.022	200		RCP10M2223M	P288N-022	DD-203	CUB4S22	GTM2122	2TM-S22		
C7	500			47X508	SI 500	D6-501	BYA10T5	UC-535	5GA-T5		
C8	.022	200		RCP10M2223M	P288N-022	DD-203	CUB4S22	GTM2122	2TM-S22		
C9	.047	400		RCP10M2473M	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47		
C10	.001	400		RCP10M4102M	P488N-001	DD-102	CUB6D1	GTM421	6TM-D1		
C11	.047	400		RCP10M4473M	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47		
C12	.022	200		RCP10M2223M	P288N-022	DD-203	CUB4S22	GTM2122	2TM-S22		
C13	.01	400		RCP10M2103M	P488N-01	DD-103	CUB4S1	GEM-411	4TM-S1		
C14	.047	200		RCP10M2473M	P288N-047	DF-503	CUB2S47	GEM-2147	2TM-S47		
C15	.082	400		RCP10M4823M	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1		

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	TRUETONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2meg	1/2	36X403	BT-82	A47F3-2meg	Q18-139X	UT-451	Loudness, Tap @ 900K
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R2	50K	1/2	40X421	B-34		Q14-123	U34	Treble
R3A	200K	1/2	40X420	B-51	A47-250K-Z	Q13-130	U44	Bass
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			KR-1	SWE-12	76-1	US-26	Power On-Off

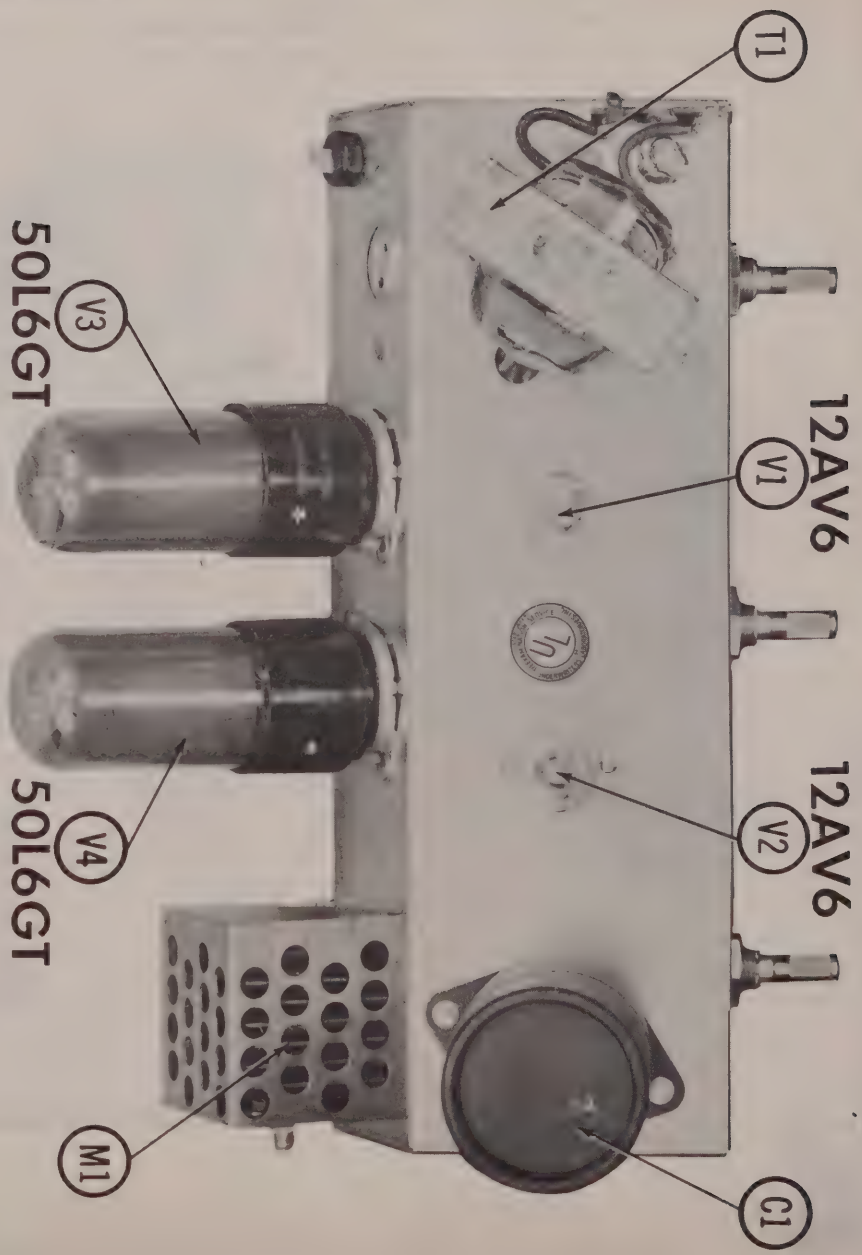
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		TRUETONE PART No.	NOTES
	OHMS	WATT		
R4	150K		B84154	
R5	10meg		B85106	
R6	220K		B84224	
R7	2200Ω 5%		B83222	
R8	12K		B84123	
R9	150Ω		B85151	
R10	10meg		B85106	
R11	220K		B84224	
R12	470K		B84474	

ITEM No.	RATING		TRUETONE PART No.	NOTES
	OHMS	WATT		
R13	10K		B84103	
R14	68Ω	2	D84680	
R15	470K		B84474	
R16	15Ω		B85150	
R17	15Ω		B85150	
R18	22K		B85223	
R19	1000Ω		B84102	
R20	17Ω		43X383	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2100Ω CT	SEC. 1	51X183							
		SEC. 2 2-4Ω								

SPEAKER

ITEM No.	TYPE SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA TRUETONE PART No.	QUAM PART No.	NOTES
SP1	6"	PM	3-4Ω	12A534	6A15	
SP2	4"	PM	3-4Ω	12A543	4A07	
SP3	3½"	PM	13-14Ω	12A535	3A15T	

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA TRUETONE PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.105A	66X15	1235AH	6RS150	Model 150		Selenium Type

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA TRUETONE PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	REMARKS
M2		81-T *				* Includes needles

MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M3	Motor	6950	

CABINETS & CABINET PARTS

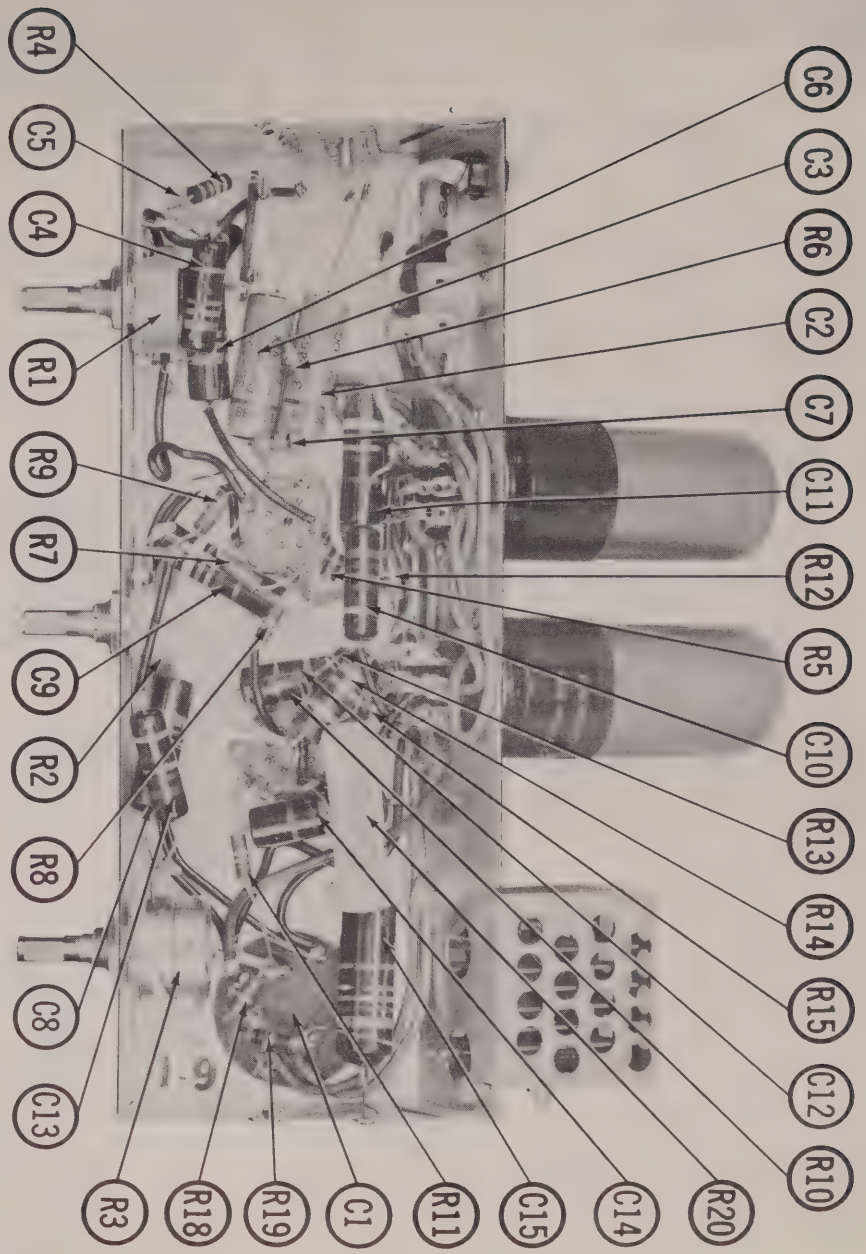
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

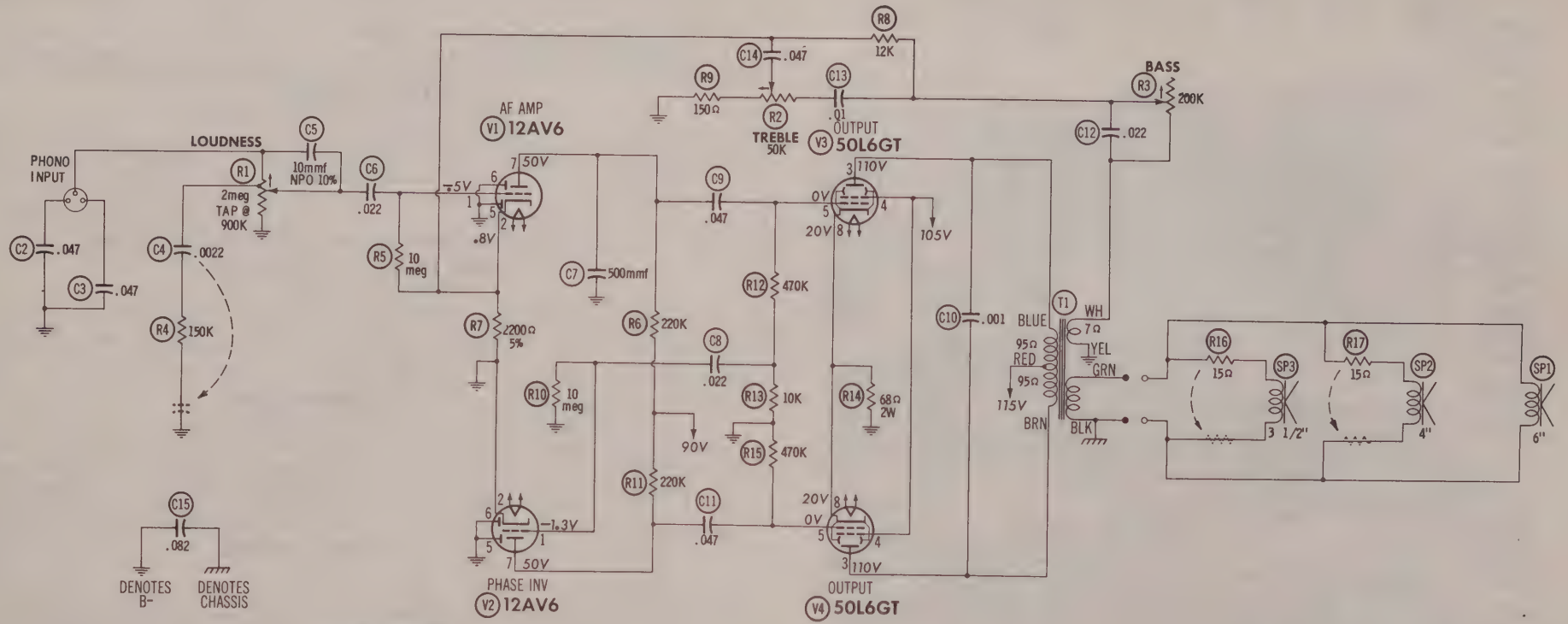
NAME	PART NO.	DESCRIPTION
Knob	10A949-1	Bass-On-Off
Knob	10A949-2	Treble
Knob	10A949-3	Loudness

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

CHASSIS BOTTOM VIEW

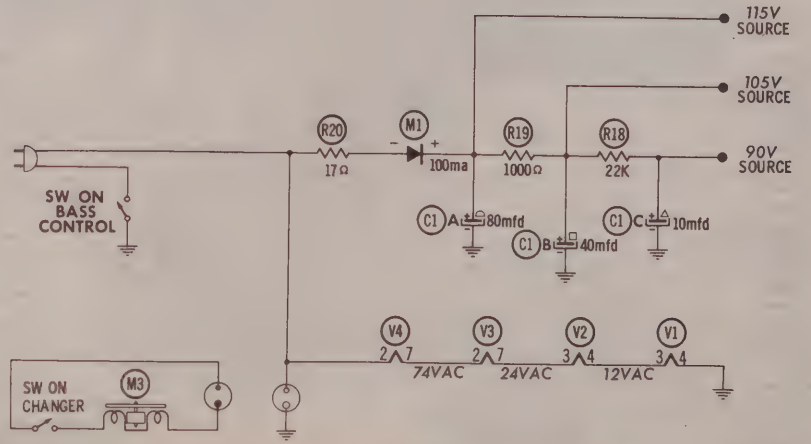




RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V1	12AV6	10meg	2200Ω	12Ω	0Ω	0Ω	0Ω	†240K	
V2	12AV6	10meg	0Ω	24Ω	12Ω	0Ω	0Ω	†240K	
V3	50L6GT	INF	74Ω	†95Ω	†1000Ω	480K	INF	24Ω	68Ω
V4	50L6GT	INF	117Ω	†95Ω	†1000Ω	470K	TP	74Ω	68Ω

† MEASURED FROM OUTPUT OF M1.
TP TIE POINT



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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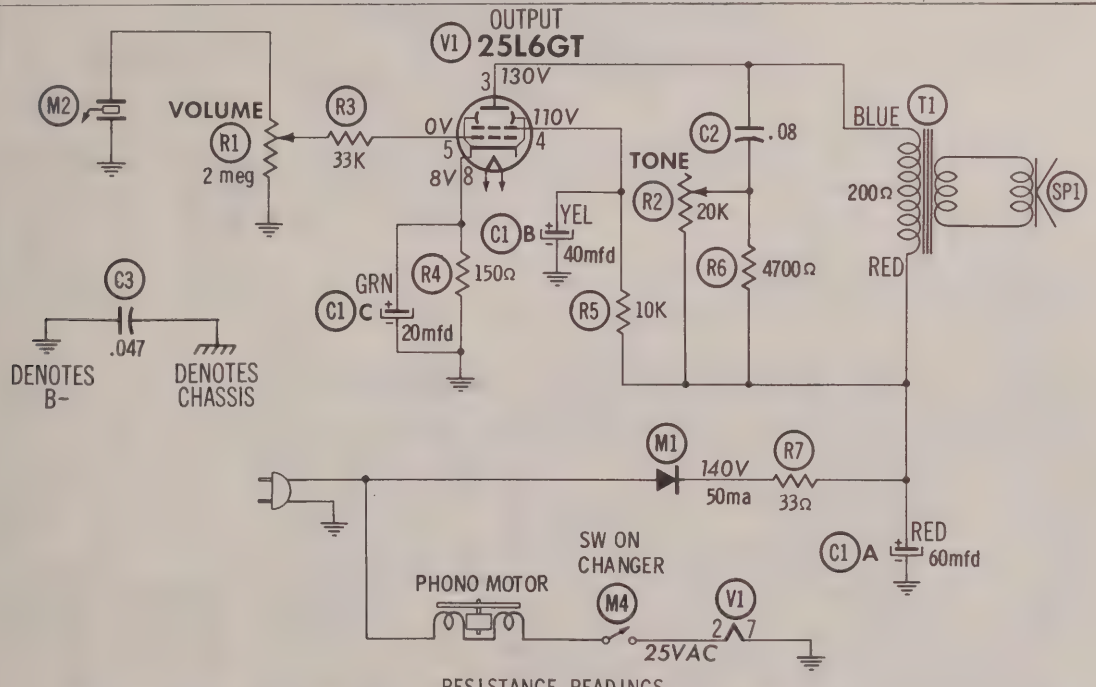
TRUETONE MODELS DC5930A, B, C

PHOTOFACT* Folder

TRADE NAME	V-M Model 630
MANUFACTURER	V-M Corp., Benton Harbor, Michigan
TYPE SET	AC Operated One Tube Phono Amplifier With 45 RPM Automatic Record Changer
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles RATING 47 Watts, .45 Amp. @117 Volts AC (Less Motor)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V1	25L6GT	NC	20Ω	†230Ω	†10K	33K	NC	0Ω	150Ω

† MEASURED FROM OUTPUT OF M1.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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JS177

V-M MODEL
630
V-M MODEL
630
SET 455 FOLDER 19

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Output	25L6GT	

ITEM No.	USE	TYPE	NOTES

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA V-M PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	60	150	12024	PRS150/25V 8040/20	BBRT8415C	TCT3116	TDLT-7	TVAS-3436.3*	
B	40	150							
C	20	25							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	REPLACEMENT DATA V-M PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	.08	400		12005	P488N-075	DF-753			5BF-S82	
C3	.047	600		12073	P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA V-M PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg	½	12370	B-75	A47-2meg-S	Q11-139	U56	Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R2A	20K	½	12371	B-23	A47-25K-W	Q13-120	U24	Tone
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	V-M PART No.	NOTES
R3	33K		11093	
R4	150Ω		10533	
R5	10K		10973	

ITEM No.	RATING OHMS	RATING WATT	V-M PART No.	NOTES
R6	4700Ω		10893	
R7	33Ω		10373	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA V-M PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2000Ω	3-4Ω	(Part of SP1)	24S53 ①	A-3025①	AU-605 ①	A-3332①	24S53 ①	S-12X①	① Use original channel frame

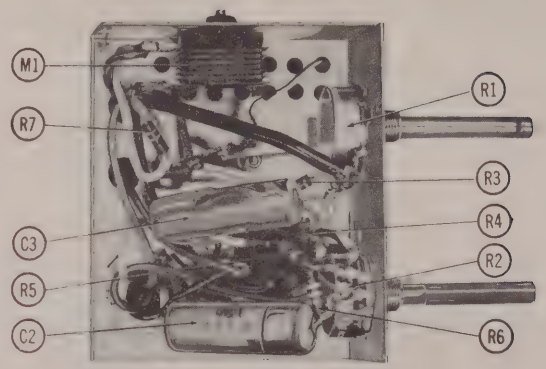
SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA V-M PART No.	QUAM PART No.	NOTES
SP1	5"	PM	3-4Ω	19116 ①	5A1	① Includes T1

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA V-M PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.049A	12526	1234AH①②	RS0650① ②	65A ② K200 ③		① Drill hole for stud mtg. ② Selenium type ③ Silicon Type

CHASSIS BOTTOM VIEW



PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA V-M PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	REMARKS
M2	14918	310-1	N8-1	9	CRA552 or CRA552D	

ASTATIC AND JENSEN NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA V-M PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M3	14627	CRA552 † or CRA552D ♦		† Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	V-M PART No.	NOTES
M4	Switch		Power Off-On (On Changer)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	16766-B	Control, 2 Used
Knob	14966-A20	Control, Black, 2 Used
Case	19024-A	Complete, Red
Case	19024-B	Complete, Blue
Handle	19008	

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

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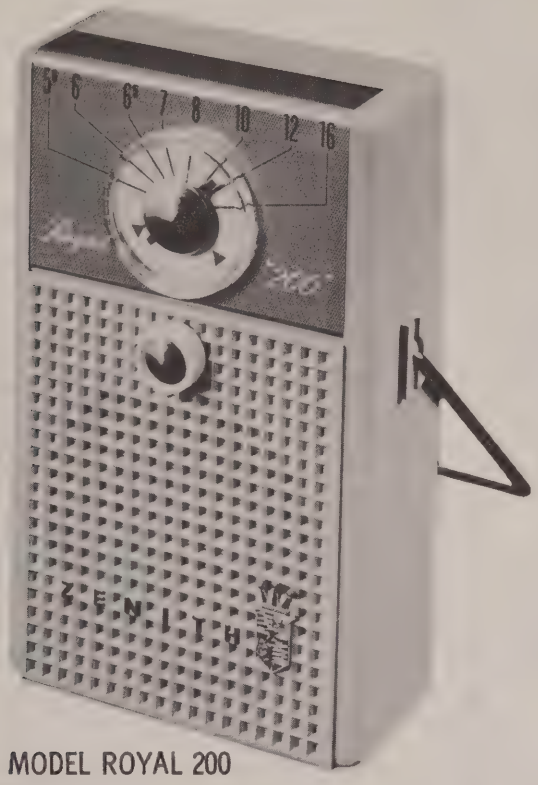
ZENITH MODELS
Royal 200F, K, V, W, 850C, L, V, W (Ch. 7AT47Z, 2, 4, 7AT48Z, 2, 4)

ZENITH MODELS
Royal 200F, K, V, W, 850C, L, V, W (Ch. 7AT47Z, 2, 4, 7AT48Z, 2, 4)



MODEL ROYAL 200

ZENITH MODELS
Royal 200F, K, V, W, 850C, L, V, W (Ch. 7AT47Z, 2, 4, 7AT48Z, 2, 4)

TRADE NAME	Zenith Models Royal 200F, K, V, W (CH. 7AT48Z, 7AT48Z2, 7AT48Z4) Royal 850C, L, V, W (CH. 7AT47Z, 7AT47Z2, 7AT47Z4) Clock Receiver
MANUFACTURER	Zenith Radio Corp. 6001 Dickens Ave., Chicago 39, Illinois
TYPE SET	Battery Operated Transistorized AM Receiver
POWER SUPPLY	6 Volts DC
RATING	10.3MA @ 6 Volts DC (No Signal, Min. Volume) 13MA @ 6 Volts DC (Signal, Normal Volume)
TUNING RANGE—BROADCAST	540 - 1600KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:
A1, A2, A3, A5.....GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531
A4, A6.....GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.		Loop	455KC (400~ Mod.)	Low Freq. End near 600KC	Across voice coil	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.		"	1620KC	Tuning gang fully open	"	A4	"
3.		"	535KC	Tuning gang fully closed	"	A5	Adjust for maximum output. Repeat Steps 2 & 3.
4.		"	1260KC	1260KC	"	A6	Adjust for maximum output.

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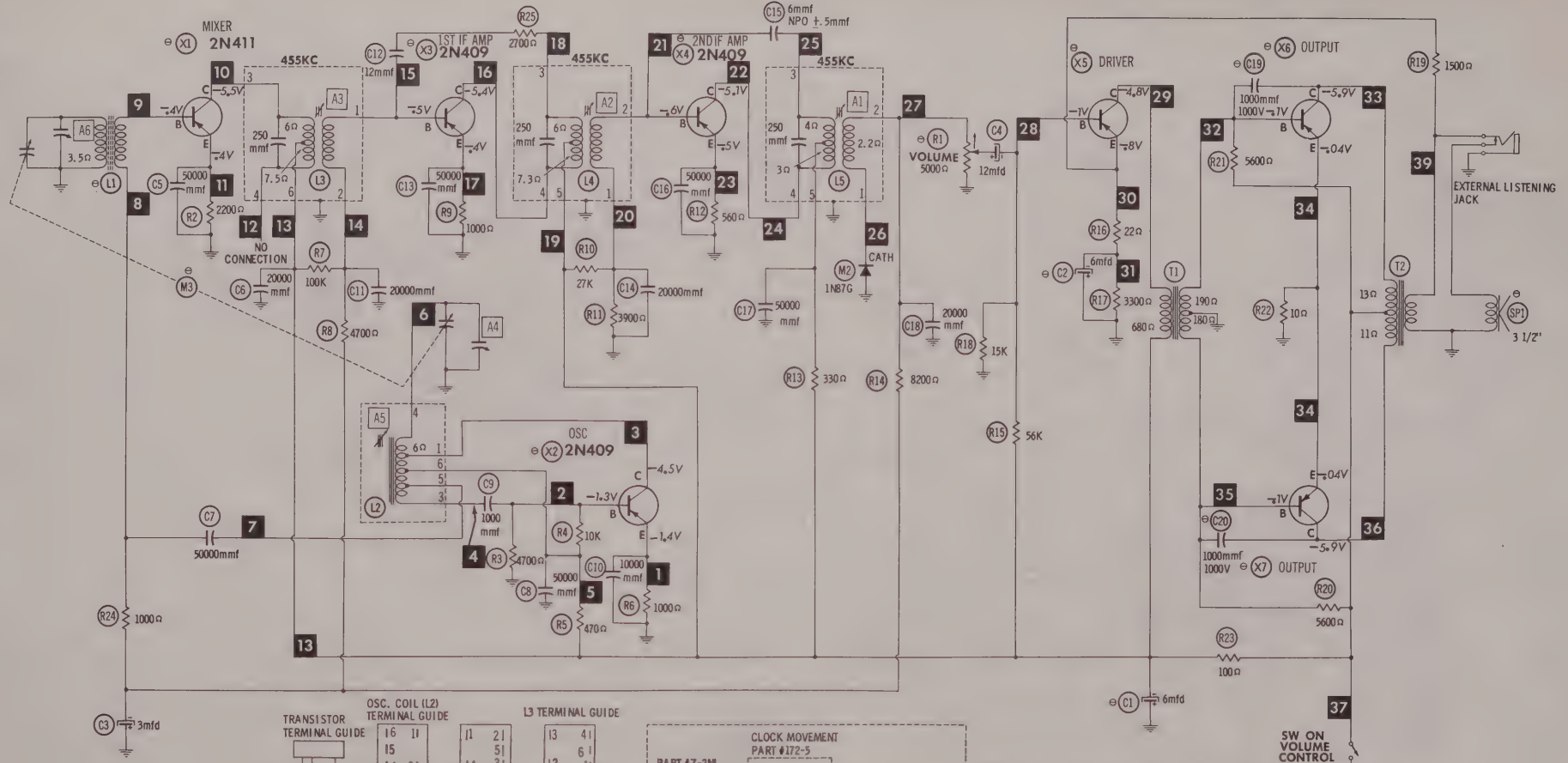
JF087

SET 455 FOLDER 20



TRANSISTOR TERMINAL GUIDE

EMITTER COLLECTOR BASE

OSC. COIL (L2) TERMINAL GUIDE

16	11
15	
14	31

L4 & L5 TERMINAL GUIDE

11	21
	51
14	31

L3 TERMINAL GUIDE

13	41
	61
12	11

RESISTANCE READINGS

ITEM	TYPE	BASE	EMITTER	COLLECTOR
X1	2N411	11K	2200Ω	†100Ω
X2	2N409	3700Ω	1000Ω	†570Ω
X3	2N409	15K	1000Ω	†100Ω
X4	2N409	3900Ω	560Ω	†430Ω
X5	121-64	12K	1200Ω	†780Ω
X6	121-64	190Ω	10Ω	†13Ω
X7	121-61	180Ω	10Ω	†11Ω

TRANSISTORS REMOVED FOR RESISTANCE MEASUREMENTS.
† MEASURED FROM JUNCTION OF R20 AND R23.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

CLOCK CIRCUITRY USED IN CHASSIS 7AT47Z, 7AT47Z2 & 7AT47Z4.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

❸ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

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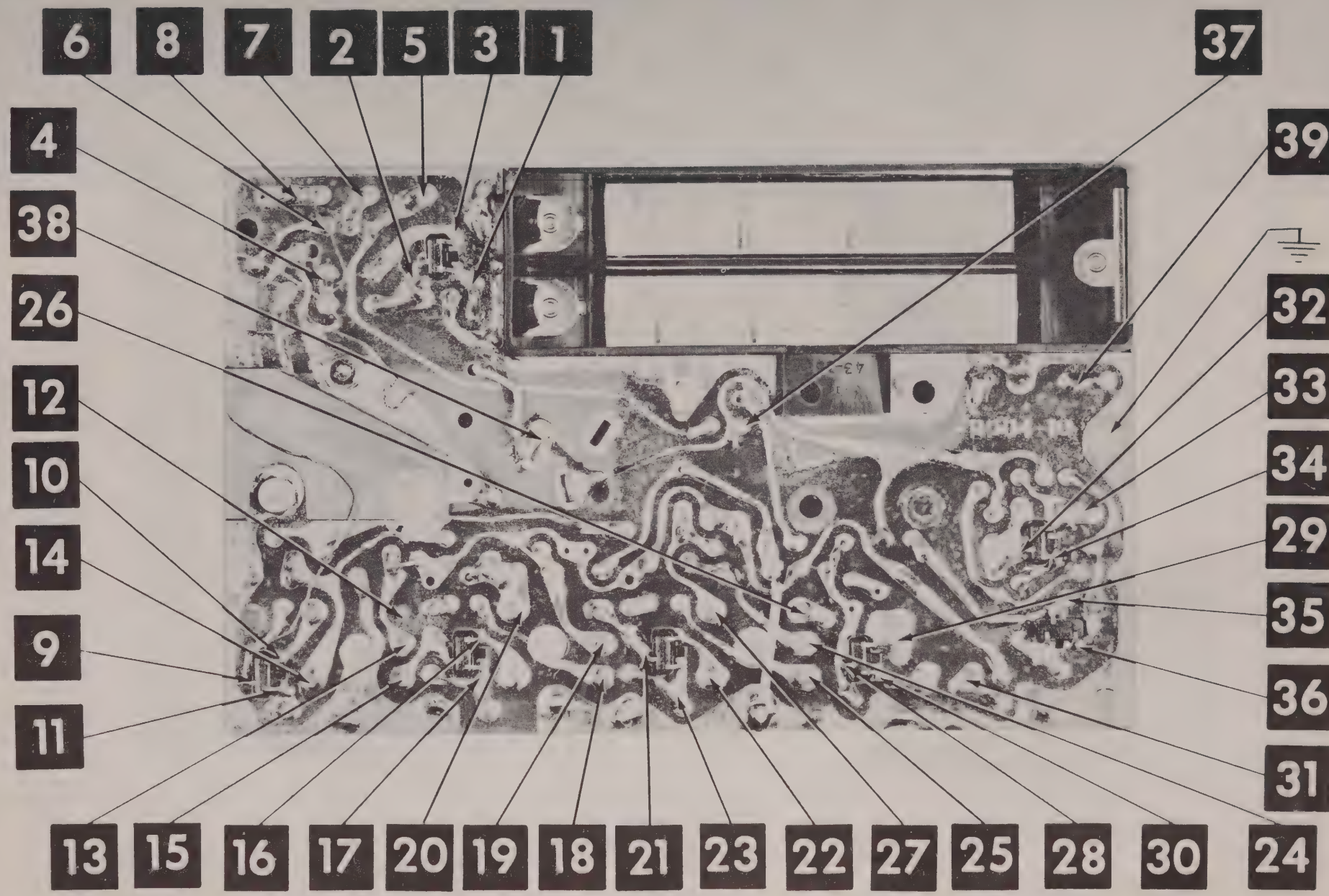
ZENITH MODELS
Royal 200F, K, V, W, 850C, L, V, W (Ch. 7AT47Z, 2, 4, 7AT48Z, 2, 4)



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PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: ZENITH PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Loopstick	S-44217 †						
L2	Osc. Coil	95-1589						
L3	1st IF Trans.	95-1628						
L4	2nd IF Trans.	95-1629						
L5	3rd IF Trans.	95-1630						

† Model Royal 850 Series Use Part #S4541l in this application.

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO PRI.	TURNS RATIO SEC.	REPLACEMENT DATA: ZENITH PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2.5	1	95-1631	TR-7		TA-35	TR-7		

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA: ZENITH PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	600Ω CT	4-6Ω	95-1632	TR-27			TA-23	TR-27		

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA: ZENITH PART No.	QUAM PART No.	NOTES
SP1	3½"	PM	4-6Ω	49-859①	3A05Z5	① Model Royal 200 Series
	3½"	PM	4-6Ω	49-878②		② Model Royal 850 Series

BATTERIES

ITEM No.	VOLTAGE	ZENITH PART No.	REPLACEMENT DATA: BURGESS "A"	BURGESS "B"	EVEREADY "A"	EVEREADY "B"	MALLORY "A"	MALLORY "B"	NOTES
M1	6V	Z-8① Z-9②		Z ①		915① E9 ②		M-15R① ZM9②	① 4 Used ② Mercury Type, 4 Used

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: ZENITH PART No.	CBS PART No.	SYLVANIA PART No.	NOTES
M2	1N87G	103-19	1N60	1N60	Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M3	Tuning Cap	22-3092	2 Gang, Model Royal 200 Series
	Tuning Cap	22-3114	2 Gang, Model Royal 850 Series

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	46-2106	Tuning, Model Royal 850 Series
Knob	46-2009	Tuning, Model Royal 200 Series
Knob	46-2008	Volume On-Off, Model Royal 200 Series
Knob	S-45407	Volume, Model Royal 850 Series
Cabinet Front	14-2446	Royal 200F
Cabinet Front	14-2443	Royal 200K
Cabinet Front	14-2445	Royal 200V
Cabinet Front	14-2444	Royal 200W
Cabinet Rear	14-2451	Royal 200F
Cabinet Rear	14-2448	Royal 200K
Cabinet Rear	14-2450	Royal 200V
Cabinet Rear	14-2449	Royal 200W
Cabinet Front	14-2537	Model Royal 850C
Cabinet Front	14-2535	Model Royal 850L
Cabinet Front	14-2536	Model Royal 850V
Cabinet Front	14-2534	Model Royal 850W
Cabinet Rear	14-2540	Model Royal 850 Series
Handle	36-218	Model Royal 200 Series
Clock Crystal	192-270	Model Royal 850 Series

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	MFGR. PART NO.	ORIG. TYPE.	USE	REPLACEMENT DATA				NOTES
				CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	121-62	2N411	Mixer		2N411		2N411	PNP ①
	121-92	2N485	Mixer			2N486		PNP ②
	121-83	2N414	Mixer					PNP ③
X2	121-65	2N409	Osc.		2N409		2N409	PNP ①
	121-91	2N483	Osc.			2N483		PNP ②
	121-82	2N413	Osc.					PNP ③
X3	121-73	2N409	1st IF Amp.		2N409		2N409	PNP ①
	121-93	2N483	1st IF Amp.			2N483		PNP ②
	121-79	2N413A	1st IF Amp.				2N413A	PNP ③
X4	121-74	2N409	2nd IF Amp.		2N409		2N409	PNP ①
	121-94	2N482	2nd IF Amp.			2N482		PNP ②
	121-80	2N413A	2nd IF Amp.				2N413A	PNP ③
X5	121-64		Driver		2N407			PNP ①
	121-95	2N362	Driver			2N362		PNP ②
	121-81	2N383	Driver				2N383	PNP ③
X6	121-61		Output		2N407			PNP ① ④
	121-96	2N632	Output			2N632		PNP ② ④
	121-84	2N383	Output				2N383	PNP ③ ④
X7	121-61		Output		2N407			PNP ① ④
	121-96	2N632	Output			2N632		PNP ② ④
	121-84	2N383	Output				2N383	PNP ③ ④

① Used in chassis 7AT47Z2, 7AT48Z2 (Black Color Dot)
② Used in chassis 7AT47Z, 7AT48Z (Red Color Dot)
③ Used in chassis 7AT47Z4, 7AT48Z4 (Green Color Dot)
④ X6 & X7 are a matched pair.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	50	6	22-2726 ①	PWE6050	NL50-6	TT6X50	ML50-6	TE-1100	
C2	50	6	22-2726 ①	PWE6050	NL50-6	TT6X50	ML50-6	TE-1100	
C3	16	3	22-2871	PWE3015	NL15-6	TT6X15		TE-1053.5	
C4	3	12	22-2884	XPP-12003	NL3-6	TT12X3	ML4-15	TE-1122	

① In some versions C1 & C2 may be combined in one unit (Part #22-3091).
In other versions C2 may be a 1 volt section (Part #22-3149).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	50000	25		22-2728	C-80V503AM	DA-503	H-05S5	TA-150	TG-S50	
C6	20000	25		22-2885 *	C-80V203AM	DA-203	H-05S2	TA-120	TG-S20	
C7	50000	25		22-2728	C-80V503AM	DA-503	H-05S5	TA-150	TG-S50	

CAPACITORS (cont)

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C8	50000	25		22-2728	C-80V503AM	DA-503	H-05S5	TA-150	TG-S50	
C9	1000	25		22-2729	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C10	10000			22-3	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C11	20000	25		22-2825	C-80V203AM	DA-203	H-05S2	TA-120	TG-S20	
C12	12			22-3035	DI 12	DD-120	L10Q12	CNO-412	5GA-Q12	
C13	50000	25		22-2728	C-80V503AM	DA-503	H-05S5	TA-150	TG-S50	
C14	20000	25		22-2885 *	C-80V203AM	DA-203	H-05S2	TA-120	TG-S20	
C15	6		NPO ±.5mmf	22-2381					5TCCB-V6S±.5mmf ▪	
C16	50000	25		22-2728	C-80V503AM	DA-503	H-05S5	TA-150	TG-S50	
C17	50000	25		22-2728	C-80V503AM	DA-503	H-05S5	TA-150	TG-S50	
C18	20000	25		22-2885 *	C-80V203AM	DA-203	H-05S2	TA-120	TG-S20	
C19	1000	1000		22-17	HVD-15-1000	DD-102	BYA10D1M	B-210	5HK-D1	①
C20	1000	1000		22-17	HVD-15-1000	DD-102	BYA10D1M	B-210	5HK-D1	①

* Model Royal 850 uses Part #22-3134.
① Some versions may use 2200mmf in this application.
▪ Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ZENITH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	5000 Ω	½	63-4392 *					Volume & Switch

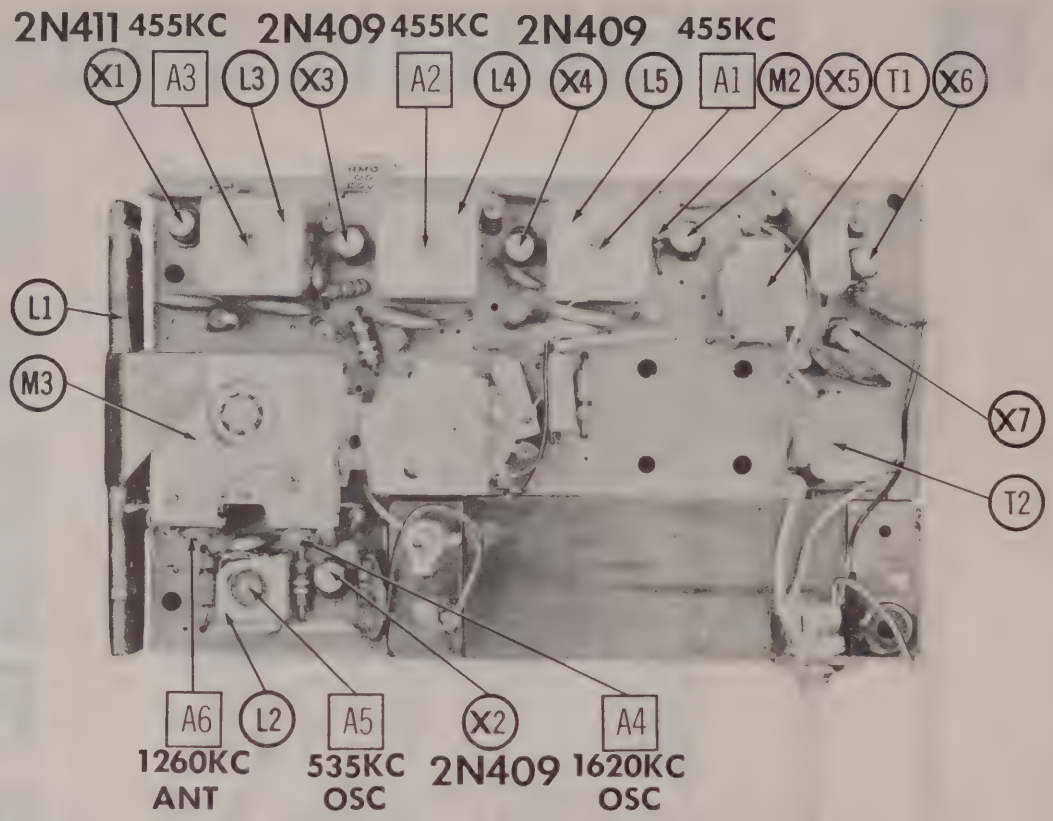
* Model Royal 850 Series use Part #63-4426 (no switch) in this application.

RESISTORS

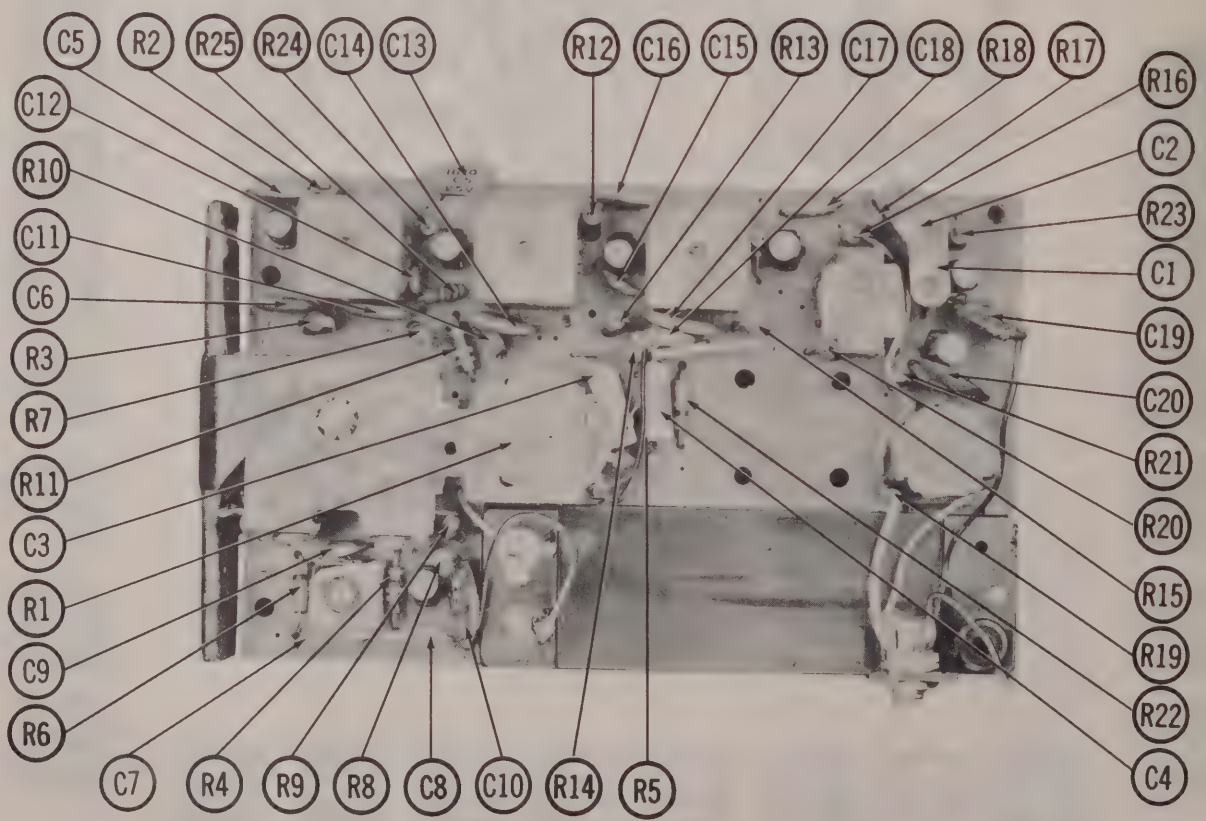
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		ZENITH PART No.	NOTES
	OHMS	WATT		
R2	2200Ω		63-1799	
R3	4700Ω		63-1813	
R4	10K		63-1827	
R5	470Ω		63-1772	
R6	1000Ω		63-1786	
R7	100K		63-1869	
R8	4700Ω		63-1813	
R9	1000Ω		63-1786	
R10	27K		63-1845	
R11	3900Ω		63-1810	
R12	5600Ω		63-1775	
R13	330Ω		63-1755	

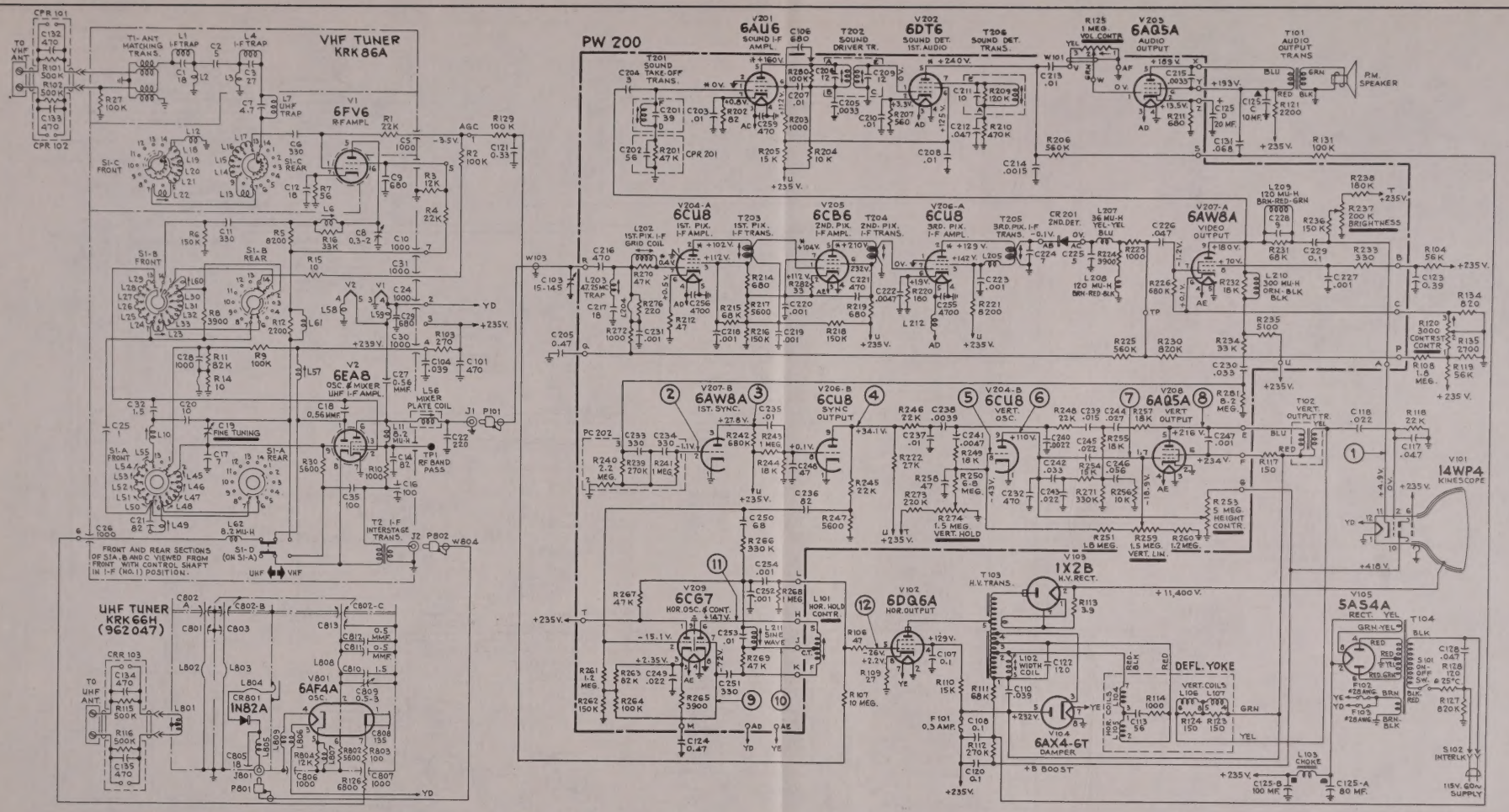
ITEM No.	RATING		ZENITH PART No.	NOTES
	OHMS	WATT		
R14	8200Ω		63-1824	
R15	56K		63-1859	
R16	22Ω		63-1715	
R17	3300Ω		63-1806	
R18	15K		63-1834	
R19	1500Ω		63-1792	
R20	5600Ω		63-1817	
R21	5600Ω		63-1817	
R22	10Ω		63-1701	
R23	100Ω		63-1744	
R24	1000Ω		63-1786	
R25	2700Ω		63-1803	



CHASSIS-TOP VIEW



CHASSIS-TOP VIEW



All schematics are shown in the latest condition at the time of printing.

All resistance value in ohms. K = 1000.

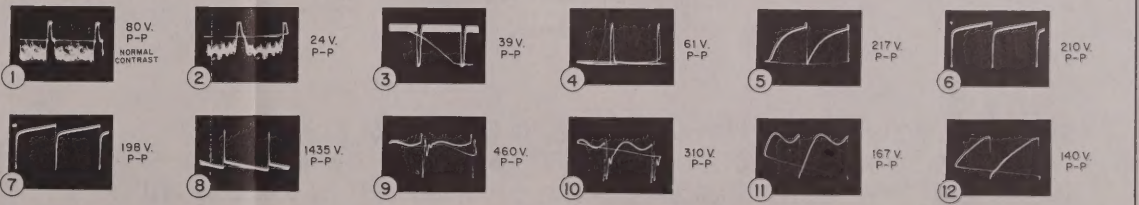
All capacitance values less than 1 in MF and above 1 in MMF unless otherwise noted.

Direction of arrows at controls indicates clockwise rotation.

All voltages measured with "Volt-Ohmyst" and with no signal input. Voltages should hold within ±20% with 117 v. a-c supply.

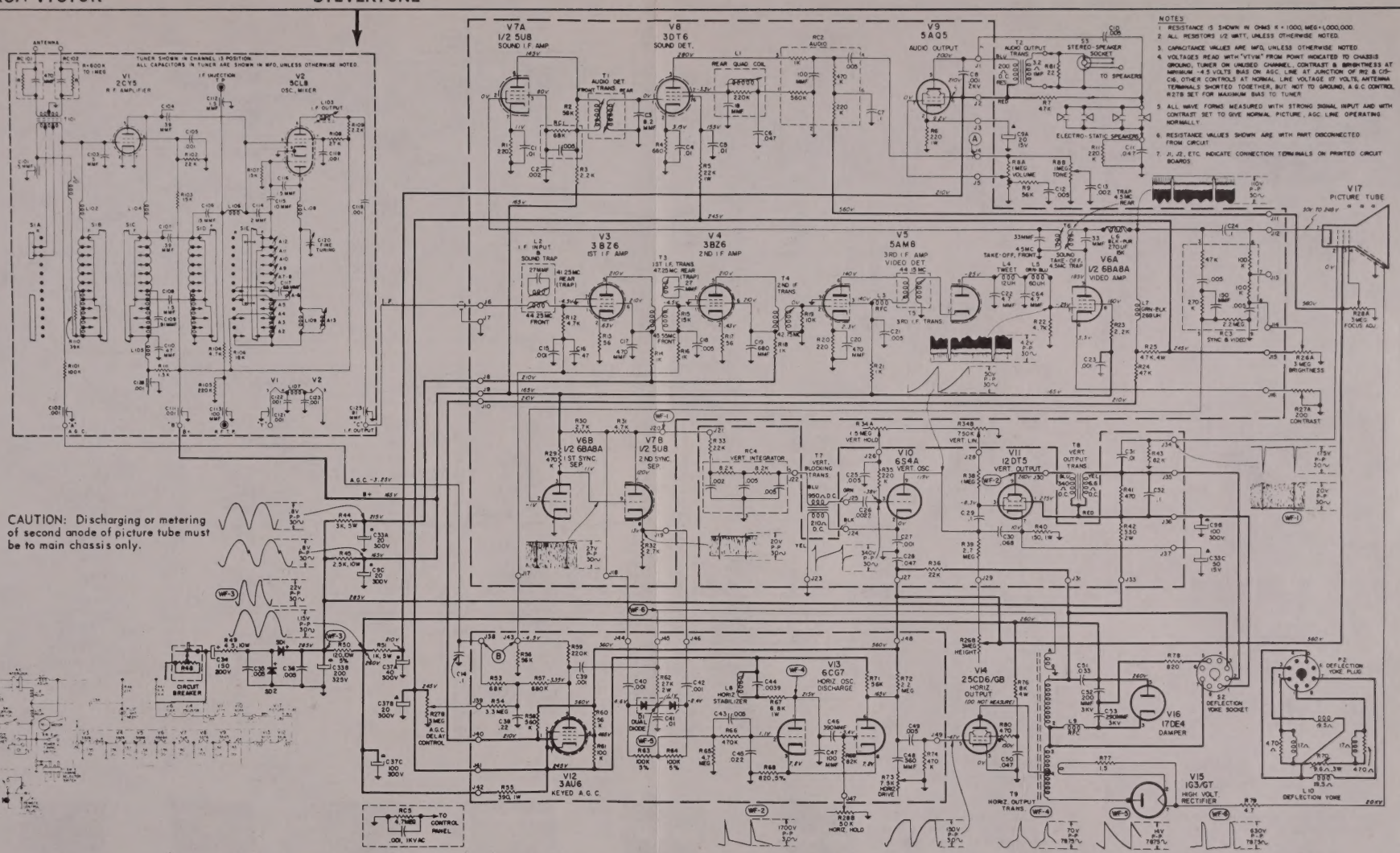
*Measured with 1 megohm, ½ watt resistor in series with meter probe.

Balloons ① ② etc., shown on schematics indicate points of observation of the waveforms shown below the individual schematic.



RCA VICTOR MODELS 140P020, U, 140P023, U, 140P024, U (CH. KCS 120E, F)

Schematic Diagram Courtesy of Radio Corporation of America


V1 2CY5 R.F. AMPLIFIER
V2 6CL8 OSC. MIXER
V3 3BZ6 1ST I.F. AMP
V4 3BZ6 2ND I.F. AMP
V5 5AM8 3RD I.F. AMP VIDEO DET.
V6A 1/2 6BA8A VIDEO AMP
V6B 1/2 6BA8A 1ST SYNC SEP.
V7A 1/2 5U8 SOUND I.F. AMP
V7B 1/2 5U8 2ND SYNC SEP.
V8 30T6 SOUND DET.
V9 5AQ5 AUDIO OUTPUT
V10 6S4A VERT. OSC.
V11 12DT5 VERT. OUTPUT
V12 3AU6 KEYED A.G.C.
V13 6CG7 HORIZ. OSC. DISCHARGE
V14 25CD6/GB HORIZ. OUTPUT
V15 1G3/GT HIGH VOLT. RECTIFIER
V16 17DE4 DAMPER
V17 PICTURE TUBE
CAUTION: Discharging or metering of second anode of picture tube must be to main chassis only.
NOTES:
1. RESISTANCE IS SHOWN IN OHMS K = 1000, MEG = 1,000,000.
2. ALL RESISTORS 1/2 WATT, UNLESS OTHERWISE NOTED.
3. CAPACITANCE VALUES ARE MFD. UNLESS OTHERWISE NOTED.
4. VOLTAGES READ WITH "VTVM" FROM POINT INDICATED TO CHASSIS GROUND, TUNER ON UNUSED CHANNEL, CONTRAST & BRIGHTNESS AT MINIMUM -4.5 VOLTS BIAS ON AGC. LINE AT JUNCTION OF R12 & C16. OTHER CONTROLS AT NORMAL LINE VOLTAGE 117 VOLTS, ANTENNA TERMINALS SHORTED TOGETHER, BUT NOT TO GROUND, A.G.C. CONTROL R27B SET FOR MAXIMUM BIAS TO TUNER
5. ALL WAVE FORMS MEASURED WITH STRONG SIGNAL INPUT AND WITH CONTRAST SET TO GIVE NORMAL PICTURE, AGC LINE OPERATING NORMALLY
6. RESISTANCE VALUES SHOWN ARE WITH PART DISCONNECTED FROM CIRCUIT
7. J1, J2, ETC. INDICATE CONNECTION TERMINALS ON PRINTED CIRCUIT BOARDS

SILVERTONE MODELS PC-160, PC-160-5, PC-162, PC-162-5, PC-164, PC-164-5, PC-180, PC-180-5, PC-182, PC-182-5, PC-184, PC-184-5, PC-186, PC-186-5, 160, 160-5, 162, 162-5, 164, 164-5, 180, 180-5, 182, 182-5, 184, 184-5, 186, 186-5 (Ch. 456. 52200, 201, 528. 52200, 201)

Schematic Diagram Courtesy of Sears, Roebuck & Company

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